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## HANDBOOK OF THE ECOLOGICAL SOCIETY OF AMERICA

ADAMS, CHARLES C., State College of Forestry, Syracuse, N. Y. Professor of Forest Zoology (Ph.D.). (2) General principles of animal (and plant) ecology; general physiology and behavior; ecology of aquatic and forest animals; ecologic and geographical distribution of animals (and plants). (3) Ill., Tenn., Mont., N. Y. (4) Va., Ala.

ALDOUS, A. E., Forest Service, Washington, D. C. Assistant in charge of range investigations (B.S.). (1, 2) Problems of plant ecology connected with range management. (3) National Forests of Idaho and Utah. (4) Cal., Ore., Ariz., N. M.

ALLEE, W. C., Lake Forest College, Lake Forest, Ill. Professor of Biology. (1) Seasonal successions in old forest ponds; rheotaxis in the isopod *Asellus communis*; reactions of fresh water fishes to environmental changes (with V. E. Shelford). (2) Relation of animal responses to environmental stimuli; analysis of the causes of animal reactions. (3) Chicago area; Woods Hole, Mass.; Norman, Okla.; Arbuckle Mts., Okla. (4) Berkshire Hills, Mass.; sandstone regions of western Ind. (6) Control of fresh water environment and of reactions of fresh water animals, particularly their rheotatic reaction. (7) Quantitative and qualitative collecting nets for fresh water; various devices for studying animal responses in the field under controlled conditions.

ANDERSON, MARK, Forest Service, Ogden, Utah. Grazing Examiner. (2) Grazing capacity of forest ranges. (3) Caribou, Farghee and Sawtooth Forests, southern Idaho. (4) Manti and Sevier Forests, Utah; Ruby and Santa Rosa Forests, Nev. (5) Gramineae, Rosaceae and Compositae. (6) Quadrat charting to determine changes taking place in vegetation on ranges.

ANDREWS, ETHAN ALLEN, Johns Hopkins University, Baltimore, Md. Professor of Zoology. (1) Distribution of *Folliculina* in branches of Chesapeake Bay. (2) Fresh and salt water forms of *Neritina*, Jamaica, W. I. Colonies of *Formica* in Baltimore Co., Md. (3) Md., Jamaica. (4) New England, Md. (5) Crayfish, Annelids. (7) Tow net.

BAILEY, IRVING W., Bussey Institution, Forest Hills, Boston, Mass. Assistant Professor of Forestry. (1) The climatic factor in the evolution and dispersal of herbaceous Angiosperms. The effects of environment upon the form and structure of the Angiosperm leaf. (2) The effects of environment upon the form, structure, and distribution of Angiosperms; climates and vegeta-

tion of the Cenozoic and Mesozoic. (3) Silvicultural problems in New England, Pa., and W. Va. (4) West coast of South America. (5) Angiosperms. (6) Silvicultural. (7) Those used in forestry and meteorological stations.

BAKER, FRANK COLLINS, New York College of Forestry, Syracuse University, Syracuse, N. Y. Zoological investigator. (1) Ecology of Mollusca. (2) Relation of mollusks to fish. (3) Yucatan, Mexico, Fla., Ill., Mich., Wis., N. Y., Ind. (4) North America, including Middle America. (5) Mollusca. (6) Breeding mollusks. (7) Various.

BAKER, HORACE BURRINGTON, Colorado College, Colorado Springs, Colo. Instructor in Zoology. (1) Physiographic and Molluscan Succession in Lake Pools; *Circinaria concava* from Cheboygan Co., Mich.; variation in *Lymnea reflexa*, from Huron County; Mollusca, in A Biol. Surv. of Sand Dune Region; notes on Mollusca of Douglas Lake Region. (2) Uniones of Douglas Lake; Mollusca of Dickinson Co., Mich.; habitat and seasonal distribution of Orthoptera of Pike's Peak region. (3) Ann Arbor, Mich.; Cuatutlapam, Mexico (State of Vera Cruz); Colorado Springs, Colo., and that region. (4) In between. (5) Mollusca, Orthoptera of Colorado. (6) Those used in work on response of clams to various factors of environment.

BAKKE, ARTHUR L., Iowa State College, Ames, Ia. Assistant Professor of Plant Physiology. (1) Studies on the transpiring power of plants as indicated by the method of hygrometric paper. The index of foliar transpiring power as an indicator of wilting. (2) Transpiring power; transpiring power and wilting. (3) Desert Laboratory; University of Chicago. (4) Regions about Tucson, Ariz., Chicago, Ill., central and northern Ia. (7) Atmometer; transpiration clip.

BALL, E. D., State Capitol, Madison, Wis. State Entomologist (Ph.D.). (1) Relation of leaf hopper to food plant and environment; distribution of leaf hoppers with reference to host plant and environment; froth production of spittle-insects; insects in arid climate. (3) Ohio, Iowa, Colo., Utah, Cal. (4) Dak., Kans., Neb., N. M. Ariz., Idaho, Ore., Wash. (5) Homoptera, *Leaf hoppers*, *Tree hoppers*. (6) Cage experiments and field observation.

BANTA, ARTHUR M., Station for Experimental Evolution, Cold Spring Harbor, L. I., N. Y. Resident Investigator (A.B., A.M., Ph.D.). (1) Relations of cave animals to their environment and to one another. Relation of near relatives of cave animals to their environment and to a possible cave environment. (2) Cave fauna and its relation to its environment. (3) Caves of southern Ind. (4) Long Island, N. Y.; caves of N. Y. and New England. (5) Cladocera, Amphipoda. (6) Testing reactivity to light from vertical and horizontal (directive) illumination. Testing reactivity to tactile stimulation by means

of locally applied and generally applied stimuli. Testing food selection.

BARROWS, WILLIAM MORTON, Ohio State University, Columbus, O. Assistant Professor of Zoology and Entomology. (1) No strictly ecological papers. (2) Ecology of spiders and insects. (3) Lake Erie; Hocking Co. and Franklin Co., O. (5) *Spiders*, insects. (6) Insect reactions; spider reactions. Genetics.

BARTSCH, PAUL, National Museum, Washington, D. C. Curator, Marine Invertebrates, U. S. National Museum; Professor of Zoology, George Washington University; Director Histologic and Physiologic Laboratories, Howard University. (1) Mollusks. (2) Mollusks and other invertebrates. (3) U. S., Bahamas, Philippines. (5) Marine Invertebrates in general. *Mollusks* in particular. (6) Breeding.

BATES, CARLOS G., Forest Service, Denver, Colo. In charge of silvicultural research, Dist. 2, U. S. Forest Service (B.Sc. in Forestry). (1) Experiments in Sand Hill planting. Climatic characteristics of Rocky Mountain Forest Types. Windbreaks, their influence and value. (2) The limitation of the forest type by ecological factors. Covers all questions concerned with the existing conditions of growth and the extension of the habitat of Rocky Mountain forest trees, both as to soil and climatic factors. (3) Nebraska sandhills. Central Rocky Mountain region, particularly vicinity of Pike's Peak. (4) Eastern and western Neb., Kas., the Black Hills, and the mountainous region of Colo. and Wyo. The rest of the U. S. east of Rockies in a more casual way. (5) Coniferae. (6) Measurement of all factors of the site, including atmospheric temperature, humidity, wind movement, evaporation, solar radiation, soil temperature, soil moisture, physical analysis of soils, chemical analysis for acidity and alkalinity, the creation of artificial site conditions as in cutting and planting experiments. (7) Most of the accepted instruments used for measurements described above. Also considerable original investigation of evaporimeters, wind velocity instruments and actinometers.

BEEBE, WILLIAM, Home address: New York Zoological Park, New York, N. Y.; field address: Tropical Research Station, Georgetown, British Guiana. Curator of Ornithology, New York Zoological Park; Directing Curator, Tropical Research Station. (1) Ecology of birds of the Neartic and Neotropical regions. (2) Ecology of tropical birds as studied in the field. (3) N. Y., British Guiana, northern South America, Mexico. (4) Much of Asia and tropics of the Far East. (5) Birds. (6) Control of moisture and molt.

BERGMAN, HERBERT F., University of Minnesota, Minneapolis, Minn. Assistant Professor of Botany (B.Sc., M.Sc.). (1) Development of climax formations in Minn. (2) Work in

progress on plant succession in Minn. Life history of bogs by determination of plant remains. (3) Minn. and N. D. (4) Mississippi Valley from N. D. to Okla.; Mich.; along east shores of Lake Michigan, Pacific Slopes of Ore. and Wash., and Columbia River valley. (5) Bryophytes, Pteridophytes, Spermatophytes, Lichens, Uredinales, Agaricales. (6) Field methods by quadrat and instruments supplemented by greenhouse experiments in physiology. (7) Quadrats, photometers, psychrometers, geotomes, atmometers, recording hygrometers, recording thermometers (air and soil).

BIRGE, EDWARD A., University of Wisconsin, Madison, Wis. Dean of the College of Letters and Science; Director of the Wisconsin Geological and Natural History Survey (Ph.D., Sc.D., LL.D.). (1) Entomostraca,—annual and vertical distribution. (2) Limnology; plankton. (3) Madison, Wis. (5) Cladocera. (7) Numerous.

BLACKMAN, M. W., 216 Stratford St., Syracuse, N. Y. Professor of Forest Entomology, New York State Laboratory of Forestry (A.M., Ph.D.). (1) Habits and life history. (2) Habits and life history of forest insects. Succession of forms in dying and dead trees. (5) All forest insects, especially beetles living under bark or in wood.

BLACKWELDER, ELIOT, Natural History Bldg., Urbana, Ill. Professor of Geology, University of Illinois. (1) Summer birds of northern Mich. (2) The influence of environment on animal distribution, as a neglected factor in geological correlation. (4) Central and southern Alaska, Wyo., Idaho and other northwestern states, northeastern China, Wis., Ill.

\*BLANCHARD, FRANK N., University of Michigan, Ann Arbor, Mich. Fellow in Zoology (A.B.). (2) Field work in animal ecology. (3) The Connecticut Valley; Douglas Lake, Mich. (4) Mich., N. H., Me., Mass. (6, 7) Meyer's flask, Secchi disc, thermometer, birge net, plankton pump.

BLISS, CHARLES F., Forest Service, Denver, Colo. Forest Examiner, U. S. Forest Service (B.Sc., M.S.). (2) Correlation of factors of the habitat in the success of natural regeneration of Engelmann spruce on sodded burns. (3) Colo. (Marshall Pass). (4) Southern U. S., Idaho and Wash. (6) Field measurement of physical factors. (7) Some work with most all.

BLODGETT, FREDERICK H., College Station, Texas. Plant Pathologist, Extension Service (Ph.D.). (1) Plant life in Md., Piedmont Area; Development of Erythronium and Lemna. (2) Relation of Lemna to habitat, Relation of climatic conditions to fungous epidemics. (Gulf storm of 1915 and Cotton Anthracnose.) (4) Tex. (5) Lemnaceae, cotton diseases, sweet potato diseases.

BOERKER, RICHARD H., Forest Service, Lander, Wyo. (A.B., M.S., Ph.D.). (1) Forest ecology, especially as related

to the requirements of trees, reforestation and reproduction of forests. (2) Forest ecology in all phases, especially applied ecology. (3) Forestry work in N. Y., N. J., Mich., Colo., and Cal. (4) Slightly familiar with all general forest regions through study and travel. (5) *Trees* and shrubs. (6) Field methods in determining habitat factors and taking meteorological observations in different forest types. Greenhouse methods, studying germination of tree seeds under measured differences of light, soil and water. (7) Evaporation tanks and boxes, rain gauges, snow gauges, anemometers, air and soil thermometers, thermographs, soil borers, hygrothermographs. Most habitat instruments.

BOWMAN, HOWARD H. M., Botanical Laboratory, University of Pennsylvania, Philadelphia, Pa. Assistant Professor (B.A., Ph.M.). (1) Mechanical tissue development in vines. Adaptability of sea grass. (2) Ecology of the dry Tortugas. Physiology and ecology of the Mangroves. (3) S. Fla. (4) Mountains of eastern N. Y.; Catskills; Long Island; Pa., N. J., Md., Va., Fla.; Cuba, Antilles. (5) Thallophytes and Spermatophytes, *Algae* and *Angiosperms*. (6) Laboratory experiments in physiology; field work in ecology and teratology. (7) Deep sea dredges, peat boring instruments, sounding instruments, hydrometers, transpirometers, etc.

\*BRADLEY, J. CHESTER, Cornell University, Ithaca, N. Y. Assistant Professor of Systematic Entomology (M.S., Ph.D.). (2) The Okefinokee Swamp, Georgia. Distribution of insects, particularly in New York. (3) Okefinokee Swamp, Ga. (4) British Columbia, Cal., N. Y., Ga. (5) Hymenoptera; *Siricidae*, *Evaniidae*, *Mutillidae*.

BRAGG, L. C., 818 Remington St., Fort Collins, Colo. Assistant in Entomology. (2) Aphids, Coccids. (3) Colo. (4) Mountains of Colo., 6000 to 8000 ft. (5) Aphids.

BRAGG, LAURA M., Charleston Museum, Charleston, S. C. Curator of Public Instruction (B.S.). (2) Flora of South Carolina with particular reference to the ecological conditions controlling distribution. (3) S. C.

BRAUN, E. LUCY, 2702 May Street, Cincinnati, O. Assistant in Botany, University of Cincinnati (Ph.D.). (1) The physiographic ecology of the Cincinnati region. (2) Physiographic ecology in general; vegetation of specific habitats; evaporation in certain plant associations; flood plain development. (3) Cincinnati and vicinity. (4) Eastern Ky., Mountains of N. C., Chicago. (5) Spermatophytes, Pteridophytes and Bryophytes. (7) Porous cup atmometer.

BRAY, WILLIAM L., Syracuse University, Syracuse, N. Y. Professor of Botany (M.A., Ph.D.). (1) Texas vegetation; New York State vegetation. (2) Successional aspects of bog and swamp vegetation in N. Y. (3) Tex., N. Y. (4) Ill., Ind.

BREITENBECHER, J. K., Biological Laboratory, Western Reserve University, Cleveland, O. Assistant Professor of Biology (Ph.D.). (2) Animal organisms of the desert at Tucson, Ariz., The reactions of *Leptinotarsae* to environmental conditions. (3) Tucson, Ariz.; Cleveland, O. (4) The islands of Lake Erie. (5) Any Insect group, especially *Chrysomelidae*, and *Bruchidae*. (6) Measurement of environmental factors. (7) All general instruments.

BRETNALL, G. H., 512 S. 14th Street, LaCrosse, Wis. Professor of Biology, State Normal School (A.M.). (2) Rôle of "hair" on xerophytic leaves. Working on *Antennaria* and *Verbascum*. (3) Near LaCrosse, Wis. (4) Southern Wis.; Monmouth, Ill. (5) *Hymenomycetes*, *Ferns*, green *algae*, especially the first. (6) Electrical methods. Ecological anatomy of plants.

BREWSTER, DONALD ROSS, Priest River Experiment Station, Priest River, Idaho. Director, Priest River Experiment Station, U. S. Forest Service (B.S.). (1) Forest ecology. (2) Forest ecology—everything relating to the ecology of forest trees and incidentally of all plant and fungus organisms. (3) Northern Idaho, western Mont. (4) Central and northern Minn. (5) *All coniferous trees and shrubs*. Evergreen vines and shrubs forming coniferous forest "floor." (6) Observations on effect of fire and cutting on forest succession. Study of forest types by means of meteorological instruments; soil analysis; evaporation. Field studies of reforestation, sowing and planting. Field and greenhouse studies of germination of coniferous tree seeds, including effect of light, heat, moisture. (7) Thermometric instruments of all kinds; evaporimeters; atmometers; psychrometers; anemometers; camera; surveying instruments.

BRIGGS, LYMAN J., Bureau of Plant Industry, Department of Agriculture, Washington, D. C. Biophysicist (Ph.D.). (1) Indicator significance of vegetation. Water requirements of plants. Transpiration in relation to environment. (2) Influence of environment on transpiration and growth. (3) Great Salt Lake basin; Southern Cal.; Great Plains, particularly northeastern Colo. (4) Intermountain district. (6) Evaporation; moisture equivalent of soils; mechanical analysis of soils; wilting coefficient; moisture content and salt content of soils; transpiration measurements; leaf temperatures by thermo-elements. (7) Automatic transpiration balances; differential thermographs for measuring radiation and wet bulb depression; salt content by electrolytic resistance.

BRODE, HOWARD S., 433 Alder St., Walla Walla, Wash. Professor of Biology, Whitman College (Ph.D.). (2) Ecology of marine animals. (3) Puget Sound, Wash.; Blue Mountain Region, Wash.; Cal. (4) Central Ill.; Woods Hole, Mass. (5) Crustacea, trees and shrubs. (6) General physiology, operating and chemical. (7) Dredge and thermometer in sea and lake.

BROWN, FOREST B. H., Department of Botany, Ohio State University, Columbus, O. (A.B., M.S.). (1) Plant Ecology of Huron Valley, Mich.; Variations of Ray Pits of Conifers. (2) Forest Types, especially of deciduous trees of central and eastern United States. (3) Southeastern Mich.; Central O. (4) Chaparral of Cal.; Sand Hills of Neb. (5) Identification of trees by histological methods, especially conifers. (7) Transit, level, compass and other surveying instruments; also thermometer, aneroid barometer, anemometer, rain gauge.

BROWN, WILLIAM H., Bureau of Science, Manila, P. I. Associate Professor, University of the Philippines (Ph.D.). (1) Ecological survey of lakes in North Carolina; Relation of substratum to growth of *Elodea*. Relation of evaporation to the water content of soil at time of wilting. Philippine Dipterocarp forests. Evaporation and plant habitats in Jamaica. (2) Relation of environment to physical types of vegetation. (3) Ariz., the Philippine Is., Jamaica. (4) Eastern United States, central Mich. (5) Dipterocarpaceae. (6) Measuring environmental factors and rates of growth. (7) Thermometers, hygrometers, anemometers, rain gauges, atmometers, radio-atmometers, actinometers.

BRUMFIEL, D. M., Iowa City, Iowa. Instructor in Animal Biology, State University of Iowa. (1) Macroscopic fauna of small brooks. (2) Influence of Floods on Animal Associations. Animal Life of Johnson County, Iowa. (3) Fayette Co., Ind.; Dickinson Co., Ill. (4) Knox Co., Ill.; parts of Franklin and Union Cos., Ind.; various other localities in Ind.; a small portion of Lane Co., Ore. (5) Elateridae (especially larvae), Reptilia.

BURNS, GEORGE PLUMER, University of Vermont, Burlington, Vt. Professor of Botany. (1) Succession of plant societies, etc. (2) Studies in tolerance of forest trees. (3) Southern Mich., Northern Mich., Vt. (7) All kinds.

BUTTERS, FREDERIC KING, University of Minnesota, Minneapolis, Minn. Assistant Professor of Botany. (1) Vegetation of the Selkirk Mountains. (2) Phytogeography. (3) Minn., Alpine regions of British Columbia. (4) Vancouver Island. (5) Conifers, Pteridophytes and red algae of northwestern N. A.

CAHN, ALVIN R., Dept. of Zoology, University of Wisconsin, Madison, Wis. Assistant in Zoology (B.S., M.S.). (1) An ecological survey of the Wingra Springs Region, near Madison, Wis., with special reference to its ornithology. (2) Ecology of Vertebrates. (3) Madison, Wis.; Waukesha Co., Wis.; Northern Penin. of Mich. (4) Northern Mich.; southern Wis.; Chicago Area; southeastern Ga.; Ithaca, N. Y.; Woods Hole, Mass. (5) Birds, mammals, fish, amphibians, reptiles. (7) Ordinary surveying instruments, field zoological equipment.



CALVERT, PHILIP P., Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa. Professor of Zoology, University of Pennsylvania (Ph.D.). (1) Ecological relations of Odonata (Dragonflies) of Mexico and Central America and of Costa Rica. (2) Ecology of Odonata generally; Seasonal Distribution of Odonata in the Tropics, particularly in Costa Rica. (3) Vicinity of Philadelphia, especially in neighboring parts of N. J., Costa Rica (one entire year). (4) Cliff Is., Casco Bay, Me.; Woods Hole, Mass.; Sachem Head, Conn.; Lake Placid, Adirondacks, N. Y.; area between Delaware Water Gap, Pa., and Catskills, N. Y.; Mt. Lake, Giles Co., Va. (5) *Odonata*. (Regret that I am unable through lack of time to identify material promptly.) (7) Air and water insect nets.

CAMERON, ALFRED E., Entomological Branch, Department of Agriculture, Ottawa, Canada. Field Officer for British Columbia (M.A., D.Sc., M.Sc.). (1) On soil insects at Manchester, England; insect association of a local environmental complex. (2) General insect ecology; insect fauna of the soil. (3) Lancashire and Cheshire, England. (4) Atlantic coast. (5) Anthomyiidae, Ichneumonidae, and parasitic Hymenoptera generally. (6) Methods relating to life history studies and environmental faunistic work. (7) Psychrometer, thermometer, rain gauge, barometer, barograph, etc.

\*CAMP, CHARLES L., Livingston Hall, Columbia University, New York, N. Y. Assistant in Zoology (A.B., A.M.). (1) Ecology of reptiles of Colorado Desert. (2) Ecology of desert animals. (3) Northwestern U. S., Cal., Sierra Nevada, vicinity of Los Angeles, southwestern U. S. (4) Wyo., Utah, Ariz. (5) Mammals, reptiles, amphibians.

CANNON, W. A., Desert Laboratory, Tucson, Arizona. Staff Member, Desert Laboratory. (1) Relation of root habit to plant distribution. (2) Physiology of roots with special reference to relation of root response to the environment. (3) Tucson, Ariz. (4) Southern Algeria. (6) Methods of studying roots in soil.

CHAPLINE, WILLIAM RIDGELY, Jr., Forest Service, Washington, D. C. Grazing Assistant, U. S. Forest Service (B.Sc.). (1) Numerous official reports of an ecological nature and assistance in the preparation of others. (2) National Forest range investigations. Management of ranges of the western states. (3) Helena, Mont.; Coconino National Forest, Ariz.; Gila and Alamo National Forests, N. M.; Manti National Forest, Utah. (4) Above regions and southeastern Neb.; vicinity of Washington, D. C. (5) Interest in taxonomy is general. Range plants. (6) Quadrat and National Forest range reconnaissance methods. (7) Usual quadrat instruments, photometer, metrological instruments, surveying instruments, hypsometer, scale, calipers and other forest instruments. Have taken some photographs.

\*CHAPMAN, ROYAL N., Department of Entomology, Cornell University, Ithaca, N. Y. Fellow in Biology (B.A., M.A.). (1) Life history of *Agrilus*. (2) Ecology of cambium-mining larvæ. Ecology of dead and decaying trees. (3) Pine Co., Minn.; N. Y. (4) Minn. (5) Coleopterous family *Buprestidae* (larvæ); mammals, rodents. (6) Work on tropisms, responses to heat, etc. Hibernation experiments with rodents.

CHARLES, GRACE MIRIAM, University of Kansas, Lawrence, Kas. Assistant Professor of Botany (A.B., A.M., Ph.D.). (2) Ecology of the wooded areas in eastern Kas. Plant societies in Benzie Co., Mich. (3) Around Chicago, in dune region near Frankfort, Mich. (4) New England; Fla.; eastern Wyo.; Colorado Springs, Colo.; eastern Kas.; southern Wis. (5) Ferns, grasses, Liliaceae. (6) Plant physiological methods.

\*CHENOWETH, HOMER E., Paxton, Ill. Instructor in Science in High School (A.B., M.A.). (2) The reactions of certain mammals to evaporation. (3) Urbana, Ill. (4) Ill., O. (5) Mice, beetles. (6) Reactions of mammals to various air conditions, humidity, temperature, and wind velocity. (7) Porous cup atmometer, rheotaxis apparatus.

CHILD, CHARLES M., Zoological Laboratory, University of Chicago, Chicago, Ill. Associate Professor of Zoology (Ph.D.). (2) Experimental control and modification of development, form, structure, and venation by environmental factors. (3) Chicago, Woods Hole, Pacific Coast. (6) Physiological methods of various kinds.

CLAYBERG, HAROLD D., National History Bldg., University of Illinois, Urbana, Ill. Assistant in Botany (M.S., A.B.). (2) Taxonomy and Ecology of *Erigeron*; Fish responses. (3) Central Ill., Chicago Region, northern Mich. (not peninsular). (5) Spermatophyta, Compositae, *Erigeron*.

CLEMENS, WILBERT AMIE, Biological Department, University of Maine, Orono, Me. Instructor in Zoology (M.A., Ph.D.). (2) Aquatic Organisms. (3) Georgian Bay, Ont.; vicinity of Ithaca, N. Y. (4) Vicinity of Toronto, Ont.; western Ont.; Canadian prairies; vicinity of Orono, Me. (5) Am particularly interested in fish and aquatic insects, especially the Ephemeridae (mayflies). (7) Pilot tube for measuring velocity of water.

CLEMENTS, EDITH SCHWARTZ, 508 5th Ave., S. E. Minneapolis, Minn. (A.B., Ph.D.). (1) The relation of leaf structure to physical factors; Herbaria Formationum Coloradensium: Herbarium Eadium Californiae. (exsiccateae). (2) Succession, variation, adaptation. (3) Throughout the western and southwestern states. (4) Colo., Cal., western states in general. (6) Experimental ecology; quadrat methods. (7) Practically all.

CLEMENTS, FREDERIC E., University of Minnesota,

Minneapolis, Minn. Professor of Botany. (1, 2) Synecology and autecology. (3, 4) Western North America. (5) Spermatophytes, Fungi. (6, 7) Experimental evolution. Instrumental and quadrat methods.

\*COBB, FRANCIS E., Field Station, Mandan, N.D. Assistant in Dry Land Agriculture, Bureau of Plant Industry (B.S.). (2) Growing trees in dry land area of northern Great Plains. (3) Mont., N. D. (4) Minn. (5) Trees and shrubs of northern Great Plains. (6, 7) Quadratting and study of environmental factors.

COKER, ROBERT E., 1414 Webster St., Washington, D. C. Assistant in Charge Division of Scientific Inquiry, Bureau of Fisheries (M.S., Ph.D.). (3) Coast of Peru, Beaufort, N. C., Mississippi Basin.

COLTON, HAROLD S., Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa. Instructor in Zoology (B.S., M.A., Ph.D.). (1) Individual ecology of certain fresh water Mollusca, particularly with Lymnaea; Individual ecology of *Purpura* (*Nucella*) *lupillus*. (2) Effects of external conditions on a pure line of pond snails. (3) Mt. Desert Island; Philadelphia region. (4) South of Cape Cod region. (5) The Lymnaeidae of the Philadelphia region. (6) Measuring growth.

CONRADI, A. F., Clemson College, S. C. Chief, Division of Entomology and Zoology, Clemson Agricultural College. (1, 2) Soil ecology in relation to subterranean field crop insects; surface ecology in relation to crop insects. (3) Piedmont, Pee Dee, coastal and sand-hill sections of S. C. (4) O., N. H., Tex. (5) Elateridae. Can not undertake identifications, but can secure them for Coccidae. (6) Temperature and moisture control; field ecology in relation to insects. (7) Insectary apparatus, air thermographs and hygrographs, soil thermographs, electric resistance thermometers.

COOK, MELVILLE THURSTON, New Brunswick, N. J. Professor of Plant Pathology, New Jersey Agricultural Experiment Station (A.B., A.M., Ph.D.). (1) Insect galls. (2) Abnormal plant growths. (3) Ind., O. (5) Parasitic fungi.

COOPER, WILLIAM S., 1523 West Lake St., Minneapolis, Minn. Instructor in Plant Physiology and Ecology, University of Minnesota (Ph.D.). (1) Climax forest of Isle Royale, Lake Superior and its development; succession of mosses; succession in alpine regions of Colo. Layering among conifers. (2) Succession everywhere. Instrumental habitat study work in progress dealing with the chaparral of California and its habitat. (3) Isle Royale, Lake Superior; Long Island; North Carolina Mts.; Colorado Mts.; California Coast ranges; Canadian Rockies; Mich. (4) Me.; eastern Md.; Mts. of Va.; vicinity of Chicago; vicinity of Sierra Nevada Mts.; southern Cal.; vicinity of Tucson, Ariz. (5) Trees in general. (6) Statistical study of vegetation, quad-

rats, instrumental habitat study. (7) Atmometer, portable rain gauge, soil moisture apparatus, psychrometer, thermometer, cobalt chloride method of transpiration study.

COVILLE, FREDERICK V., Department of Agriculture, Washington, D. C. Botanist, Department of Agriculture (A.B.). (1) Relation of plants to desert conditions. Relation of plants to soil acidity. (2) Relation of plants to soil acidity. (5) Juncaceae, Grossulariaceae, Vacciniaceae, Ericaceae.

COWLES, HENRY C., University of Chicago, Chicago, Ill. Professor of Plant Ecology, University of Chicago (Ph.D.). (1) Physiographic ecology; Textbook of general plant ecology. (2) Physiographic ecology, experimental ecology, forest ecology, applied ecology. (3) Me., Mass., N. Y., Conn., Fla., Tenn., Ind., Ill., Mich., Wis., Ark., La., Ariz., Wash., Mont. (4) Most of U. S., southern Canada, southern Alaska, British Isles. (5) Plants. (6) Atmometry. (7) Atmometers.

CRAMPTON, HENRY EDWARD, Barnard College, Columbia University, New York, N. Y. Professor of Zoology, Barnard College; Curator of Invertebrate Zoology, American Museum of Natural History. (1, 2) Heredity and environment problem. Mollusca in Polynesia. (3, 4) Polynesia, South America, West Indies, as well as eastern U. S. (6) Experimental Embryology.

\*CRAWFORD, HENRY GORDON MacGREGOR, Wilton Grove, Ontario, Canada (B.S.A.). (2) Hibernation of the white grub. (4) Western Ontario, Nova Scotia.

\*CROW, J. W., Ontario Agricultural College, Guelph, Canada. Professor of Horticulture (B.S.A.) (1) Work on pollination. (2) The ecological basis of horticulture. (3) Ontario. (4) Canada; most states of U. S.

DACHNOWSKI, ALFRED PAUL. Bureau of Plant Industry, Washington, D. C. (Ph.D.). (1) Peat bogs; distributional and economic; also physiological. (2) Regional and physiological ecology. (3) O., Mich., Ind., N. C. (4) Fla., Wash. (5) Identification of bog plants. (6) Physiological methods. (7) Almost all those in use at present time.

DANA, SAMUEL T. Forest Service, Washington, D. C. Assistant Chief of Forest Investigations, U. S. Forest Service (A.B., M.F.). (1) Forest types. (2) Life history of forest trees and types, with special reference to their environment. Forest influences. (3) Generally throughout the western states. (4) Northeast, Southeast, Rocky Mountains, Southwest, Pacific and Lake states. (5) Forest trees in general.

DAVENPORT, CHARLES BENEDICT, Cold Spring Harbor, Long Island, N. Y. Director Department of Experimental Evolution, Carnegie Institution of Washington; Director, Biological Laboratory of the Brooklyn Institution of Arts and Sciences (Ph.D.). (1) Animal ecology of the Sand Spit, Cold Spring Harbor. Behavior of Collembola. Experimental Mor-

phology. Numerous papers on Animal Behavior. (2) Animal Societies, especially at Cold Spring Harbor. (3) Cold Spring Harbor, L. I.; Chicago. (5) Fresh water Bryozoa.

DAVIDSON, JOHN, Kerrisdale, British Columbia. Provincial Botanist (F.L.S., F.B.S.E.). (1) Botanical exploration and survey of certain areas in British Columbia. (2) Relation of plant-associations and vegetation zones to the nature of the soil and rainfall. (3) Coast area of British Columbia, Garibaldi Mountain region and Skagit River basin, N. of 49th parallel. (4) Drybelt areas of British Columbia. (5) Spermatophyta. (6) Histological and physiological methods. (7) Lens, aneroid, camera, and plant press.

DAYTON, WILLIAM ADAMS, Forest Service, Washington, D. C. Plant ecologist, U. S. Forest Service (B.A., M.A.). (1, 2) Direction and collaboration in ecological work as applied to range investigations in National Forests. (3) Coconino Nat. For., Ariz.; Wallowa Nat. For., Ore.; Shasta Nat. For., Cal.; Eldorado Nat. For., Cal. (4) N. Y., Mass., Md., Va.; Southern Appalachians; Grand Canyon, Ariz.; Blue Mts., Ore.; mountain regions of northern Cal. (5) Natural forage plants. (6) Quadrat methods. (7) Quadrat appliances; meteorological, surveying, and forest apparatus; photography.

DEERE, EMIL O., Bethany College, Lindsborg, Kas. Professor of Biology (A.M., S.M.). (1) Relation of animals to temperature and to moisture. (2) Plant and animal geography and distribution. (3, 4) Saline and McPherson Cos., Kas.; Vicinity of Chicago.

DE FOREST, H., 100 W. 26th Street, Baltimore, Md. (B.S., M.F.). (1) On ecological investigations. Forest botany. (2) Plant geography, plant ecology, silvics.

DETMERS, FREDA, Department of Botany, Ohio State University, Columbus, O. Assistant Professor, Department of Botany (B.S., M.S., Ph.D.). (1) A phytogeographical study of Buckeye Lake. A floristic study of Orchard Island. (2) On the characteristics of bog flora. The influence of environment on the anatomy and histology of plants. (3) Buckeye Lake, O.; observations on bogs in northern Mich., northern O., Nova Scotia, and the panhandle of Alaska. (4) Forests and bogs of the southern part of Nova Scotia; almost all regions of Ohio; the forest lakes and bogs of northern Mich.; the forests and prairie of the Middle West; the forests of the Pacific Coast states; the foot hills of Colo. (5) Carices.

DICE, LEE RAYMOND, State Agricultural College, Manhattan, Kas. Instructor in Zoology (A.B., M.S., Ph.D.). (1) Vertical movements of *Daphnia*. (2) Animal behavior; habits of vertebrates; ecological distribution. (3) Southeastern Wash., Flathead Lake, Mont. (4) Interior Alaska, Central Cal. (5) Birds and mammals.

DICKERSON, MARY C., American Museum of Natural History, New York, N. Y. Editor, Associate Curator (herpetology) (B.S.). (1) Life histories; animal behavior; associations. (3) Southern New England. (4) Ariz., Mich., Tenn., N. Y., Cal. (5) Reptiles, Batrachians.

DODDS, G. S., 9 Allen Place, Columbia, Mo. Assistant Professor of Zoology, University of Missouri (A.B., A.M., Ph.D.). (1) Ecological work in botany. (2) Entomotraca in plains and mountains of Colo. (3) In mountain area near University of Colo., Mt. Laboratory at Tolland, Colo., and in plains and mountains near Boulder, Colo. (4) Region of Columbia, Mo.; other parts of plains and mountains of Colo.; region about Woods Hole, Mass. (5) *Phyllopoda*, *Cladocera*, Copepoda, Stone flies, May flies, Caddis flies. (7) Recording thermometers, psychrometer, plane table and level, aneroid barometer, camera.

DOUTHITT, FRED D., 114 Sansome Street, San Francisco, Cal. Grazing Examiner, U. S. Forest Service. (2) Succession of vegetation types. (3) Cal. (4) Black Hills, S. Dak.; northern Ariz.; southeastern Idaho; Cal.; northwestern Nev. (6) Sample quadrat work.

DU BOIS, HENRY M., Natural History Building, University of Illinois, Urbana, Ill. Assistant in Paleontology, University of Illinois (S.B., A.B., A.M.). (2) Work in progress on the variation of Puget Sound Brachiopoda and on fossil brachiopods. Interested in Paleontologic ecology. (3) San Juan region of Puget Sound. (4) Ind. and central Ill. (5) *Brachiopoda*, *fossil and recent*. (6) Statistical measurements of characters. (7) Marine dredging.

\*DuPORTE, E. MELVILLE, Macdonald College, P. Q., Canada. Research Assistant in Biology (M.Sc., B.S.A.). (2) Life histories of orchard caterpillars. (3) Montreal and vicinity. (4) Leeward Islands, West Indies. Eastern Canada. (5) Muscoid flies.

\*EATON, ELON HOWARD, Hobart College, Geneva, N. Y. Professor of Biology. (1) Birds of New York. (2) Limnology of Finger Lakes. Controlling factors in bird distribution. Food of birds. (3, 4) Western N. Y., Adirondaeks. (5) *Birds*, *Vertebrates*. (7) Deep water thermometer. Plankton net.

EDMONDSON, C. H., University of Oregon, Eugene, Ore. Assistant Professor of Zoology (Ph.D.). (1, 2) Protozoology. (3) Lake regions of Japan; Friday Harbor, Wash.; Tahiti; Beaufort, N. C.; high mountain lakes of Colo.; Dry Tortugas, Fla. (4) Willamette Valley, Ore. (5) *Protozoa*, especially, *Foraminifera*, *Rhizopods*.

ELLIS, MAX MAPES, University of Colorado, Boulder, Colo. Assistant Professor of Biology (Ph.D., Sc.D.). (1, 2) Fishes, Amphibians, and Reptiles. (3) Colo., British Guiana, South America. (5) Fishes, Amphibians, Reptiles.

ELROD, MORTON J., University of Montana, Missoula, Mont. Professor of Biology (B.A., M.A., Ph.D.). (1) Lakes of Glacier National Park. Environment and its effects. (2) Ecology of Flathead Lake. Fauna of Missoula Valley. Lakes and Mountains of Glacier Park. Fishes of Flathead Lake. (3) Western Mont. (4) Mont. (5) Montana birds, butterflies, dragonflies, shells, mammals, trees, Entomostraca, fishes. (7) Nets, dredges, climatological instruments, barometers, and camera.

EMERTON, J. H., 194 Clarendon Street, Boston, Mass. (1, 2) Distribution of spiders, especially through New England and Canada. (4) Neighborhood of Boston, White Mountains, Maine woods and coast; Rocky Mountains, Banff and Laggan, Jasper and Doile. (5) Will examine and identify spiders for New England and New York and northward across Canada.

ESTERLY, CALVIN O., Occidental College, Los Angeles, Cal. Professor of Biology, Occidental College; Zoologist, Scripps Institution for Biological Research, La Jolla, Cal. (1) Behavior and movements of marine animals. Food and feeding habits of marine copepods. (2) Vertical movements of plankton and relation of this to external conditions. (3) Region around San Diego, Cal. (5) *Copepods* (marine), Schizopods. (6) Those relating to behavior toward light, etc. (7) Plankton nets and allied apparatus.

EVANS, ARTHUR T., Boulder, Colo. Instructor in Biology, University of Colorado (A.B., A.M.). (1) Reptiles and amphibia. Ecological distribution of dragon flies. (2) Stream-side vegetation. Ecological successions. (3) Mich., Colo. (4) Northern Peninsula of Mich.; Boulder, Colo.

EWING, HENRY ELLSWORTH, 509 Welch Avenue, Ames, Ia. Assistant Professor, Iowa State College (Ph.D.). (1) Parasitism, The origin and significance of Parasitism in the Acarina. The analysis and classification of the various aspects of parasitism, according to host species. The significance of distribution of parasites. (2) Changed environmental conditions as a factor in species building. (3) W. Ore. (4) Region around Ithaca, N. Y.; region around Ames, Ia.; various localities in Ore. (5) *Acarina*, *Phalangidea*, *Pseudoscorpionida*. (6) Field and laboratory experiments in life histories and habits, and the effects of temperature, moisture and other elements of environment on growth, virility and general somatic character.

EWING, JAMES, Carleton College, Northfield, Minn. Assistant Professor of Botany (M.A., B.Sc.). (2) Plant successions. Tension zone between prairie and forest in Minn. (3) Northwestern Minn. (4) Chicago district. (5) Rosaceae. Gramineae. (7) Hatchet and measuring tape.

FASSIG, OLIVER L., U. S. Weather Bureau, Custom House, Baltimore, Md. Professor of Meteorology, U. S. Weather Bureau; Associate in Meteorology, The Johns Hopkins University

(Ph.D.). (1) The period of safe plant growth. (2) Climate and plant life. (3) Md.

FINLEY, CHAS. W., State Normal School, Macomb, Ill. Professor of Biology and Agriculture (S.B., S.M.). (1) Distribution of prairie chicken in Ill. Nesting habits of the robin. (2) Behavior of brook faunas. Behavior of birds; nesting habits. (3) Prairies of Ill.; sand dunes of Lake Mich. (4) Mankato, Minn.; Macomb, Ill. (5) Insects and birds. (6) Laboratory experiments in rheotaxis, phototaxis, and thigmotaxis. Distribution of life in a pond. (7) Evaporimeter.

FISHER, RICHARD THORNTON, Bussey Institution, Jamaica Plain, Mass. Assistant Professor of Forestry and Director of the Harvard Forest (A.B., M.F.). (1) Silvical studies of forest trees and their silvicultural treatment. (2) The factors controlling the distribution, development and competition of tree species. (3) Ore., Cal., central New England. (4) Most of the area of the U. S. except the Southeast, the Southwest and the plains states. (6) The empirical methods of practical forestry.

FOLSOM, DONALD, Botanical Department, University of Minnesota, Minneapolis, Minn. Assistant, Botanical Department, University of Minnesota (A.B., M.A.). (2) Work in progress on precise study of response of plants to measured environments. (3) Nebraska sand hills; lake, swamp and forest regions of northern Minn. (4) Pike's Peak, Colo.; N. Dak., S. Dak., Mont. (5) Ranunculaceae. (6) Minute anatomy (histological and cytological), quadrats, field readings of temperature, humidity and soil moisture. (7) Quadrat tape, thermometers, soil borers and cans, balance, psychrometers.

FORBES, CHARLES NOYES, Bishop Museum, Honolulu, Hawaii. Curator of Botany, Bishop Museum (B.S.). (1) Vegetation on lava flows of known date. (2) Botany of the Pacific Islands. (3) Hawaiian Islands, all islands of the main group. (4) Cal. (5) Hawaiian *Phanerogams* and *Ferns*. (7) The usual meteorological instruments, including the standard atmometer.

FORBES, STEPHEN A., 703 Michigan Ave., Urbana, Ill. Director, Illinois State Laboratory of Natural History, Illinois State Entomologist, Professor of Entomology, University of Illinois (Ph.D., LL.D.). (1) Work on birds, fishes and insects. (2) Aquatic animals and insects. (3) Throughout Ill.

FOX, HENRY, U. S. Entomological Laboratory, Clarksville, Tenn. (Ph.D.). (1) Insect and plant and soil distribution; correlation with physiography. Local studies of Cicindelidae and Orthoptera. (2) Relation of insect, especially Orthopteran, distribution and frequency to environmental factors. (3) Eastern Pa., southern N. J. (5) Cicindelidae; *Orthoptera* (of eastern and central states); Scarabaeidae (in part), *Isosoma* (Hymenoptera); grasses, sedges, Juncaceae. (6) General insect breeding methods.



FRASER, C. McLEAN, Biological Station, Nanaimo, British Columbia. Curator, Pacific Coast Biological Station, Nanaimo, B. C. (B.A., Ph.D.). (1) Taxonomic and distributional work on hydroids. (2) Hydroid distribution; ecology in connection with life history of Pacific food fishes; general marine zoology; the relation of density and temperature variation to distribution. (3) Canso, Nova Scotia; Harpswell, Me.; Woods Hole, Mass.; Beaufort, N. C.; throughout the Vancouver Island and Puget Sound regions. (4) Have examined the majority of North American species of hydroids and many species from European waters, Japan and Australian coasts. Have some general acquaintance with the marine fauna of the Nova Scotia and British Columbia coasts. (5) *Hydroids*. General interest in almost all marine groups. (6) Collecting and preserving marine zoological material. Life history problems in connection with marine forms. (7) Dredges, nets, water bottles.

FREE, E. E., 1105 Madison Ave., Baltimore, Md. (A.B.). (1) Soil physics and soil geology. (2) Soil physics; atmosphere of soils. (3) Soil work in all parts of arid U. S. (4) Practically all parts of states of Wash., Ore., Cal., Nev., Utah, Ariz., N. M., and Tex. (6) Soil examinations. (7) All surveying and ordinary climatic instruments. Soil sampling devices; alkali bridge.

FROTHINGHAM, EARL HAZELTINE, Forest Service, Washington, D. C. (A.B., M.S.). (1) Birds of Michigan. Silvicultural work on Douglas fir, aspens, and white pine. The northern hardwood forest. (2) Life histories of forest stands; forest reproduction; succession of forest types; experimental study of different methods of treatment of sample plots; comparative growth rate of trees of different light requirement under same and different site factors. (3) Me., Conn.; central Mich., Wis.; southern Appalachians. (4) White Mts. of N. H.; northern Alleghenies of Pa.; Catskill Mts.; forest fringe of Minn.; sand dunes of Lake Mich.; sand-hills of Neb.; Rocky Mts. of southern Colo.; Uinta Mts., Utah. (5) Northeastern hardwood and coniferous trees and their associated shrubs and herbs. (6) Sample plots; stem analysis. (7) Forestry and surveying instruments; increment borer; photography.

FULLER, GEORGE DAMON, University of Chicago, Chicago, Ill. Instructor in Ecology, University of Chicago (Ph.D.). (1) Habits of various sand dune plants, *e. g.*, *Populus deltoides*. Evaporation and soil moisture in relation to plant succession. Vegetative reproduction in *Picea Mariana*. (2) Vegetation on the sand dunes of Lake Michigan; soil moisture studies; evaporation studies. (3) Chicago, Ill., region; Lake Michigan, East Shore. (4) Rocky Mountains of Colo.; Portions of Long Island, N. Y.; and of Province of Quebec, Canada. (6) Evaporation and soil moisture studies. (7) Atmometer, camera.

GABRIELSON, IRA N., Biological Survey, Washington, D. C.

Assistant in Economic Ornithology, U. S. Biological Survey (B.A.). (1, 2) Relation of birds to environment. (3) Different localities in northwestern and central Iowa. (5) Coleoptera and Lepidoptera (larvae), birds, Coleoptera and Lepidoptera (larvae), because of their importance as food for birds.

GAIGE, FREDERICK M., Museum of Zoology, Ann Arbor, Michigan (B.S.). (1) Several miscellaneous papers of localized regions. (2) Properly faunistic studies. Ecological surveys in this country and on the northern coast of South America. (3, 4) South America, as well as several of the West Indian islands. (5) Insects, particularly Formicidae. Also birds, mammals, reptiles.

GAIL, FLOYD W., University of Idaho, Moscow, Idaho. Associate Professor Botany (M.A.). (2) Leaf structure as affected by moisture, wind, shade, etc. (3) Idaho. (4) Neb., Idaho. (5) All Angiosperms, but especially *grasses* and *Asteraceae*. (7) Anemometers, thermographs.

GANO, LAURA, Richmond, Ind. (B.S., M.S. in Agric., Ph.D.). (2) Plant succession; agricultural botany. (3) Chicago; Richmond, Ind.; Tallahassee, Fla.

GARRETT, A. O., 615 Ninth East Street, Salt Lake City, Utah. Head, Department of Biology, Salt Lake High School (A.B.). (2) Parasitism of smuts and rusts on their hosts. The ecology of the Great American desert. Ecological Associations of the Wasatch regions. (3) Wasatch Mountains; Great American desert in Utah. (4) Bourbon Co. and Douglas Co., Kas. (5) Ustilaginales, Uredinales, *Spring flora of the Wasatch region*.

GATES, FRANK C., Carthage College, Carthage, Ill. Professor of Biology (Ph.D.). (1) The plant associations of limited areas; transpiration; sand dune plants; revegetation of denuded areas; evaporation; plant associations and successions; relation of bird and plant associations. (2) The plant associations and their successions in Ill. Evaporation and plant succession. Dynamic ecology in general. (3) Beach, Chicago, Urbana and JoDavies regions, Ill.; Mich.; Central Luzon, P. I. (4) Western Canada; Pacific states; Rocky Mt. states; Great Plains and prairie states; Hawaii, Japan, Eastern China, Northern Luzon, P. I. (5) Compositae, Cyperaceae, Ericaceae, Leguminosae. (6) Weighing transpiration, laboratory methods, the observational (including the "car-window") and photographic field methods. (7) Camera, the regular meteorological field instruments, soil instruments.

GIBSON, J. W., Education Department, Victoria, B. C. (M.A.). (2) The geographic plant ecology of British Columbia, and its applications to agriculture. (3) In several districts around Chicago and in the valley of the Gatineau, Province of Quebec. (4) Eastern Ontario, and several districts in British Columbia. (6) Control of light, temperature and current on

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stream flow. (7) Instruments used in experiments in rheotaxis and phototaxis.

\*GLASGOW, ROBERT D., 924 W. Illinois St., Urbana, Ill. Instructor in Entomology, University of Illinois (A.B., Ph.D.). (2) Diseases of subterranean insects. (3) Ill. (4) Southeastern U. S. (5) Coleoptera. *Phyllophaga* (*Lachnosterna*). (6) Field and laboratory studies of susceptibility and resistance in insects to infection by microorganisms and fungi pathogenic for these animals.

GLEASON, HENRY ALLAN, 10 Geddes Heights, Ann Arbor, Michigan. Assistant Professor of Botany and Director of the Botanical Gardens, and Arboretum, University of Michigan (Ph.D.). (1) Sand dune vegetation; origin and history of the prairies; Isle Royale, Mich.; relation of evaporation to succession; introduced species. (2) Ecological field methods; relation of evaporation to succession; development of vegetation in the Middle West; ecological anatomy; migration of the Vernoniaeae, phytogeography in general. (3) Mich., Ill., Colo. (4) Ceylon, Java, Philippine Ids., Canadian Northwest, practically all of the United States. (5) The genus *Trillium*; The North American *Vernoniaeae*. (6) Atmometry, the quadrat method and other unpublished methods of describing and recording the structure of vegetation. (7) Atmometers, photometers.

\*GLEISSNER, MAX J., Branch, Ulster Co., N. Y. Forester, Game Keeper and Manager of the Forstmann Estate, Branch, N. Y. (Doktor Ingenieur). (1) Relation of *Chlamydothrix* and *Galionella* to the formation of manganese iron products and the relation of manganese and lime to tree growth. (2) Relation of soil bacteria to tree growth. Relation of vermin to the propagation of game. Relations of animals to forest conditions. Interrelations of trees, undergrowth, soil cover and soil organisms. (3) Baden, Germany. Catskill Mts. (4) Southern Germany. Northern Atlantic States. (5) Dendrology, entomology. (6) Soil chemistry. Chemical and physical properties of the soil in relation to plant growth. Methods of economic entomology, and propagation and protection of game.

GOLDMAN, EDWARD A., Biological Survey, Washington, D. C. Assistant Biologist, U. S. Biological Survey. (1, 2) Ecology in its general bearings as affecting birds and mammals. (3) No detailed work in any special locality. (4) Western United States and Middle America. (5) Birds and mammals.

GOLDSMITH, G. W., Lafayette, Louisiana. Teacher of Biology (B.A.). (3, 4) Northern Minn., southern La., Chicago region. (5) Termites, *Bombus*. (7) Psychrometer, photometer, thermometer.

GRIFFIN, LAWRENCE EDMONDS, University of Pittsburgh, Pittsburgh, Pa. Professor of Zoology (Ph.D.). (2) Ecology of coral reefs. (3) Philippine Ids. (4) West Indies. (5) Corals, *Amphibia*, *Reptilia*.

GRIGGS, ROBERT F., Ohio State University, Columbus, O. Assistant Professor of Botany (Ph.D.). (1) Descriptive ecology; plant geography. The effect of the eruption of Katmai on vegetation. (2) Plant distribution. The revegetation of Katmai. (3) Ohio, Alaska, British Columbia. (4) Two years in N. Dak.; two years at Washington, D. C.; one summer in southern Tex.; six weeks in Porto Rico; two months in Guatemala; two summers in Vancouver Island.

GRINNELL, JOSEPH, University of California, Museum of Vertebrate Zoology, Berkeley, Cal. Director Museum of Vertebrate Zoology, University of California (Ph.D.). (1) Geographical distribution; life zones; faunal areas in California, in birds, mammals and reptiles. (2) Life zones (vertebrate animals) in Sierra Nevada. (3, 4) Alaska and Cal. (5) Birds, mammals and reptiles. (6) Only *in nature*. (7) Collecting equipment.

HALL, HARVEY M., Department of Botany, University of California, Berkeley, Cal. Assistant Professor of Botany (Ph.D.). (1) Botanical survey of San Jacinto Mountain. (2) Geographical distribution of plants in western North America. Experimental evolution of plants. (3) Cal. (4) Rocky Mts. (5) Compositae, especially *Madieae*.

HAMILTON, C. C., Department of Entomology, Cornell University, Ithaca, N. Y. (B.S.). (2) The effect of evaporation on carabid larvae. (4) Kansas in general, eastern Colo., east central Ill. (5) *Cicindelidae larvae*, and *Carabidae larvae*.

HANKINSON, THOMAS LEROY, 900 Eleventh Street, Charleston, Ill. Professor of Zoology and Physiology, State Normal School (B.S.). (2) Fresh water life, especially fish. Forest and prairie vertebrates. (3) Central Ill.; Houghton Co., Mich.; Whitefish Point region, Mich.; Walnut Lake, Mich.; Oneida Lake, N. Y. (4) Cayuga Lake region, N. Y.; Parts of Fla. and Cuba; Central Ill.; Makanda region, Ill.; Winona Lake region, Ind.; several localities in Mich. (5) *Fish*, especially *Cyprinidae*, and all other vertebrates. (7) Especially interested in field photography.

HARGITT, GEORGE T., 909 Walnut Ave., Syracuse, N. Y. Associate Professor of Zoology, Syracuse University (Ph.D.).

HARPER, ROLAND M., College Point, N. Y. (Ph.D.). (1) Relations of plants to soils, fluctuation of water, fire, etc. (2) Plant sociology and geography. (3) N. Y. to Fla. and Ark.; also Mich. (4) Mass., Conn., Ill., Ky., Tenn., La. to Cal., Nev. to Mo. (5) Gymnosperms, Cyperaceae, *Sarraceniaceae*, *Ericaceae*.

HARRIS, J. ARTHUR, Cold Spring Harbor, Long Island, N. Y. Investigator, Station for Experimental Evolution (Ph.D.). (1) Crayfishes; floral ecology; physico-chemical properties of cell sap in relation to geographical distribution. (2) Chemical factors in relation to distribution. (3) Arizona deserts,

Jamaican deserts, Long Island, Jamaican rain-forests, Everglades. (4) Great Plains, Rocky Mts. (6) Breeding experiments and chemistry.

HARSHBERGER, JOHN W., 4839 Walton Ave., Philadelphia, Pa. Professor of Botany, University of Pennsylvania. (1) A phytogeographic survey of North America; the vegetation of South Florida. (2) Pine Barren vegetation of N. J.; comparative study of the ecologic condition of the islands south of New England: Long Island, Block Island, Martha's Vineyard, and Nantucket. (3) Southeastern Pa., N. J., New England high mountains, Nantucket, Long Island, Mts. of N. C. and Fla., Mexico, West Indies, Bermuda. (4) Cal., Yellowstone Park, Mexico, West Indies, Europe. (5) Myxomycetes; Fungi in general; Eastern trees. (6) Methods of soil study, hygrometric investigation, microscopic study of leaves. (7) Hygrometer, percolation cylinders.

HART, CHARLES A., National History Building, Urbana, Ill. Entomologist in Illinois State Entomologist's office. (1) On the biology of the sand areas of Illinois (Hart and Gleason); also ecological treatment in various other papers. (2) Ecology of sand insects. (3) Illinois River. (4) Southern Wis., Miss., Okla., La., Kas., eastern Colo., northern Tex. (5) *Hemiptera*, orthoptera, neuropteroids. (6) Observations of environments and their content from an ecological viewpoint.

HARVEY, E. MARIS, Watsonville, Cal. Scientific Assistant Bureau of Plant Industry (Ph.D.). (1) Work on evaporation. (2) Redwood associations. (3) Chicago region and Williamsburg, Va. (7) Atmometers.

HARVEY, LEROY HARRIS, Western State Normal School, Kalamazoo, Mich. In charge of Department of Biology (S.B., M.S., Ph.D.). (1) Physiographic ecology of Mt. Ktaadn, Me., The phytogeographical relations of the Mt. Ktaadn flora, The floral succession in the prairie-grass formation of southeastern S. Dak. (2) The original plant formations of the Kalamazoo region. Transpiration investigations. (3) Me., S. Dak., Mich. (6) Transpiration and water content determination. (7) Habitat instruments.

\*HASTINGS, GEORGE T., 7 Robbins Place, Yonkers, N. Y. Teacher of Biology, DeWitt Clinton High School, New York City (B.S.) (1) Flora of central Chile. Epiphytic tree vegetation of New York. (2) Hydrophytic communities of Tully Lakes, central N. Y. (4) N. J., southeastern Pa. (5) Flowering plants.

HEADLEE, T. J., Experiment Station, New Brunswick, N. J. (1, 2) Entomology (economic).

HEIMBURGER, HARRY V., Hamline Univ., St. Paul, Minn. Assistant in Zoology, University of Illinois (A.B., A.M.). (1) The factors that determine the distribution of *Boleosoma nigrum*

in Douglas Lake, Mich. (2) Working on earthworms. (3) Douglas Lake, Mich.; Urbana, Ill.; Greencastle, Ind. (4) Puget Sound near Friday Harbor, Wash.; various parts of Mich., Ill., Ind., Mo. Traveled through portions of Canada and Western U. S. (5) Oligochaeta, Families Lumbricidae, Megascolecidae. (6) Reactions of animals to humidity gradients and temperature gradients. Apparatus for modifying and treating air and maintaining gradients in air. (7) Porous cup atmometer, recording thermometers, plankton nets, dredge, various fish nets and traps.

HENSEL, R. L., Forest Service, Tucson, Arizona. In charge of the Santa Rita Experimental Range. (2) General forage and range plants. (3) Wallowa Mountains, Ore. (4) Northeastern Ore., southwestern Tex. (5) Grasses and palatable weeds. (6) General field work only.

HERMS, W. B., University of California, Berkeley, Cal. Associate Professor of Parasitology. (1) Parasitology, Entomology. (2) Mosquito survey of Cal. (3) Sandusky Bay region of Lake Erie; Cal. (4) Scioto Co., O.; vicinity of Cambridge, Mass. (5) Diptera, particularly Culicidae. (6) Light reactions. (7) Field collecting apparatus.

\*HEWITT, C. GORDON, Department of Agriculture, Ottawa, Canada. Dominion Entomologist (D.Sc.).

\*HICKS, HENRY, Westbury, Long Island, N. Y. Nurseman (B.S. in Agric.). (1) Acclimatization and landscape planting on Long Island. (2) Plants of the pine barrens of Long Island. Methods of transplanting. (3) Long Island, N. Y. (4) Ithaca, N. Y., Norfolk, Va.

HILDEBRANDT, F. M., 516 N. Stricker Street, Baltimore, Md. (A.B.). (2) The relation of climate to the growth of certain plants, using data secured in various parts of Maryland. (3, 4) The immediate vicinity of Baltimore. (6) Laboratory methods in physics, chemistry, zoology and physiological botany. (7) Porous cup atmometers, cobalt chloride transpiration method, maximum and minimum thermometers.

HILL, ALBERT FREDERICK, 250 Osborn Botanical Laboratory, Yale University, New Haven, Conn. Assistant Curator of the Botanical Collections. (1) Flora of the Penobscot Bay region. (2) Vegetation of the Penobscot Bay region. (3) Penobscot Bay region, Me. (4) Most of New England. (5) Spermatophytes.

HILL, GEORGE R., JR., Utah Experiment Station, Logan, Utah. Professor of Botany, Agricultural College, Plant Pathologist Utah Experiment Station (Ph.D.). (2) Pasture survey of Cache Valley, considering indigenous and introduced species as affected by soil, soil moisture, alkali and grazing. Relation of soil moisture, etc., to distribution and amount of *Rhizoctonia fusarium*. (3) Several counties in Utah. (4) Most of Utah accessible by railroads; parts of Snake River Valley in Idaho; en-

environs of Ithaca, N. Y.; environs of St. Louis, Mo. (6) Plant physiological and pathological. (7) Meteorological and soil instruments.

HILL, ROBERT R., Forest Service, Albuquerque, N. M. Grazing Examiner, U. S. Forest Service (B.A.). (2) Effect of grazing upon yellow pine reproduction in the Southwest. Classification of forage types on National Forests in Arizona and New Mexico. (3) Ariz., N. M. (4) Middle west. (5) Flora of forest areas in the Southwest. (6) Quadrat methods; field study of environmental factors.

HOFMAN, JULIUS V., Carson, Washington. Forest Examiner, Director Wind River Experiment Station, U. S. Forest Service (B.S.F., M.F., Ph.D.). (1) Forest succession; ecology of *Populus deltoides*. (2) Ecology of forest trees, their distribution, establishment and limitations of type; also influences of parent trees on progeny. (3) Near St. Paul, Minn.; northern Idaho; western Wash. Pacific slope region west of Cascade Mts., in Wash, and Ore. (4) Wash., southern Minn. (5) *Coniferae* (*western*), Juglandaceae, Salicaceae, Betulaceae, Cupuliferae, Ulmaceae, Lauraceae, Saxifragaceae, Platanaceae, Rosaceae, Leguminosae, Aceraceae, Rhamnaceae, Cornaceae, Oleaceae, Caprifoliaceae. (6) Viability and vitality of seed (forest), Germination and establishment of seedlings, Pathology of seedlings in nursery and field. Methods were usually devised to serve the purpose. (7) Psychrometer, evaporimeter, soil thermometer, photometer, anemometer, geotome, compasses, levels, thermometers, rain gauges, thermographs, microscope, and culture plates.

HOLMES, S. J., University of California, Berkeley, Cal. Assistant Professor of Zoology (B.S., M.S., Ph.D.). (1) Natural history of Crustaceans, and soil insects. The tropisms of animals. (2) Interest general. (3, 4) Woods Hole, Mass., parts of Cal. coast; environs of Madison, Wis.; Ann Arbor, Mich. (5) Crustaceans.

HOPKINS, A. D., Bureau of Entomology, Washington, D. C. Forest Entomologist, in charge of forest and shade tree insect investigations (Ph.D.). (1) Relations of insects to their hosts. Influence of climate. Phenology. (2) The relation of climatic factors to the periodical phenomena of insects and their hosts. (3) W. Va., since 1895; D. C., since 1902. (4) Principal forested areas of the U. S. (5) Beetles of the superfamily *Scolytoidea*. (6) Methods of observing and recording phenological events of plants and insects. The percentage principle in insect control. (7) Maximum and minimum thermometers.

\*HOSMER, RALPH S., Department of Forestry, Cornell University, Ithaca, N. Y. Professor of Forestry and Head of Department (B.A.S., M.F.). (1) Forestry, especially spruce in New York and Maine. (2) Silvics of American trees. (3) N. Y., New England, Hawaii. (4) Southwestern and northwestern U. S. (6) Surveys and original description.

\*HOTTES, CHARLES F., University of Illinois, Urbana, Ill. Professor of Plant Physiology. (3) Colo. (4) Rocky Mountains, southern Cal., N. M. (6) Recording of growth, transpiration, photosynthesis; reaction to light and gravity. (7) All instruments used in ecological field work.

HOUSE, HOMER DOLIVER, Education Building, Albany, N. Y. State Botanist of New York (Ph.D.). (1) Sand dunes of Coos Bay, Ore.; mountains of western N. C. (2) Peat bogs and inland lakes of New York. (3) N. Y., western N. C., Ore., Mich. (4) N. Y. to Ga., Wash., Ore. (5) *Convolvulaceae*, *Violaceae*, *Orchidaceae*.

HOWARD, ARTHUR DAY, U. S. Fisheries Laboratory, Fairport, Iowa. Scientific Assistant (Ph.D.). (1) Fresh water mussels and their environment. Specifically, mussels in relation to fishes. (2) Survey of an area in the Mississippi River for a study of mussels and associated species. (3) Mississippi River in Iowa and Ill.; Desplaines River, Ill.; Puget and Wash. Sounds, Wash.; Amherst, Mass.; Woods Hole. (5) Naiades, birds, fishes. (6) Methods employed in problems of fresh water mussels. Laboratory experiments in vertebrate physiology. (7) Instruments usually employed in biological surveys of water areas.

HOWE, CLIFTON D., University of Toronto, Toronto, Canada. Assistant Professor in Botany and Forestry (Ph.D.). (1) Distribution of forest types on certain areas. Forest reproduction on certain areas. (2) Conditions of forest reproduction. Forest ecology in general. (3) Nova Scotia, Ontario, British Columbia, Vt. (5) *Trees and shrubs*. (6) Determination of water content of soils. Mechanical analysis of soils. Sample plots.

HUMPHREY, H. B., Bureau of Plant Industry, Washington, D. C. Cereal Pathologist (Ph.D.). (1) Plant societies on Monterey (Cal.) Peninsula. Natural reforestation in Northern Idaho. (2) Relation of ecologic factors to cereal pathology. (3) Monterey, Cal., and Coeur d'Alene Lake region of Northern Idaho. (4) San Juan Islands, Puget Sound, southern Wash., eastern Md. (6) Those employed by Clements. (7) Thermographs, porous cup atmometers, hydrographs, etc.

HUNTINGTON, ELLSWORTH, 222 Highland Street, Milton, Mass. (Ph.D.). (1, 2) Relation of climate to changes in fauna and flora. (3) Western and Central Asia, Mexico and Central America, southwestern U. S. (5) Experiments on the effect of temperature, moisture, etc., upon human activity.

HUNTSMAN, A. G., 65 Thorold St., Toronto, Canada. Lecturer in Biology, University of Toronto; Biologist, Biological Station St. Andrews, New Brunswick (B.A., M.B.). (1, 2) Marine biology. (5) Tunicata and higher crustacea, chaetognaths. My chief work has been the simple ascidians. Will consider, but not at present promise, identification in these groups.



HURTT, LEON C., Forest Service, Las Cruces, New Mexico. Grazing Examiner (B.Sc.). (2) The ecological factors of plants. The formation; invasion and succession. (3) Northern Wis.; northeastern Idaho; Lincoln, Neb.; central Utah; southern N. M., and Ariz. (4) Southern Neb., central Utah, southern Mo., Colo. (5) Gymnosperms, Gramineae, Compositae. (6) Reconnaissance, quadrat method, greenhouse work. (7) Geotome, soil thermometers, psychrometer, photometer.

HUXLEY, JULIAN LOVELL, Rice Institute, Houston, Tex. Assistant Professor of Biology (B.A.). (2) The habits of birds, especially courtship.

ISLEY, FREDERICK B., Central College, Fayette, Missouri. Professor of Biology (B.S., M.S.). (1, 2) Ecology of fresh water mussels. (3) Chicago; Wichita, Kas.; Tonkawa, Okla.; and various localities in Okla.; Fayette, Mo. (5) Orthopterous insects, fresh water mussels. Will be glad to identify Mississippi Valley material in either group.

JACKSON, HARTLEY H. T., U. S. National Museum, Washington, D. C. Assistant Biologist (A.M., Ph.D.). (1) Effect of chemicals upon photaxis in *Hyalella*. Natural history of *Hyalella*. Ecological succession and source of ingresson of land vertebrates in Ridgeway Bog, Wis. Distribution of mammals. (2) Faunal areas; associational ecology; individual ecology of vertebrates and amphipods. (3) Wis., White Mts., Ariz. (4) Northern Ill., eastern Minn., southwestern Mo., eastern central Ariz.; region contiguous to D. C. (5) Mammals, birds, reptiles, and batrachians, fish. (6) Reactions of animals to light, gravity, contact and chemicals. (7) Nets and traps of many types, aneroïd, transit.

JARDINE, JAMES T., Forest Service, Washington, D. C. In charge National Forest Range Investigation (B.S.). (1) Range management involving applied ecology. (2) Ecological studies which will give the fundamental data necessary or essential to the most efficient management and utilization of the forage crops on range lands. (3) Have aided in planning and directing ecological work throughout National Forest Range lands and on desert ranges of the Southwest. (4) National Forest regions of the west and desert regions of the Southwest.

JENNINGS, OTTO EMERY, Carnegie Museum, Pittsburg, Pa. Curator of Botany, Carnegie Museum; Acting Professor of Botany, University of Pittsburg (Ph.D.). (1) Ecological formations of Pittsburg and vicinity; Vegetation of Cedar Point, Ohio; Botanical Survey of Presque Isle, Erie Co., Pa.; Ecology of the mosses of western Pennsylvania. (2) Ecology of the Isle of Pines, Cuba; ecology of the region northwest of Lake Superior. (3) Pa., O., western Ontario, Isle of Pines. (4) Idaho, Wash. (5) Mosses, Spermatophytes. (7) Climatological instruments, soil sampling, photography.

JEWELL, MINNA E., Dept. of Zoology, University of Illinois, Urbana, Ill. Graduate fellow, University of Illinois (A.B., A.M.). (2) Ecology of parasitic worms; anoxybioism. (4) Pike's Peak region, central Ill., northeastern Kas. (5) Cestodes, Tubificids. (6) H ion and osmotic pressure determination, Oxygen determination.

JOHNSON, DUNCAN S., Johns Hopkins University, Baltimore, Md. Professor of Botany. (1) Vegetation of the Banks at Beaufort, N. C.; relation of plants to tide levels (with H. H. York). (2) Distribution of maritime plants. (3) N. Y., N. C. (4) Md., Conn., Me.

JONES, LYNDS, Spear Laboratory, Oberlin, Ohio. Associate Professor of Animal Ecology, Oberlin College (A.B., Sci.M., Ph.D.). (1) Ornithology. Distribution. (2) Distribution of forest trees, of tide-flat animals, of insects in relation to food plants. (3) Northern O., southern Ontario, Coast of Wash. (4) Southern Cal., central Utah, Iowa. (5) *Ornithology*, dendrology, entomology. (6) Field experiments.

JUDAY, CHANCEY, Biology Bldg., University of Wisconsin, Madison, Wis. Lecturer in Zoology, University of Wisconsin; Biologist, Wisconsin Geological and Natural History Survey. (1) The quantity of plankton in fresh water lakes and its relation to environmental factors. (2) Various problems in the field of limnology. (3) Wis., Ind., Colo., Cal., N. Y. (5) Copepods and Cladocera. (6) Testing out the reactions of plankton crustacea to light. (7) Various kinds of limnological apparatus, such as plankton nets, traps, pumps, thermometers, thermophones, centrifuges, dredges.

KELLOGG, VERNON L., Stanford University, Cal. Professor of Entomology and Lecturer in Bionomics, Stanford University. (1, 2) Parasitism; geographic and host distribution of parasites. (4) Cal. (5) Anoplura and Mallophaga (external parasites of birds and mammals).

KENETY, W. H., Cloquet, Minn. Director of Cloquet Experiment Station; Assistant Professor, University of Minnesota (B.F., M.S.). (1) Natural reproduction of conifers in Lake States. Meteorological factors and their influence on forest types. (2) Meteorological influences; silviculture; history and factors determining the Lake States "Pinerics." (3) Northeastern Minn. (4) Western Mont., Minn., Wis., Ia. (5) *Conifers*. (6) Quantitative field work.

KINCAID, TREVOR, University of Washington, Seattle, Wash. Head, Department of Zoology, University of Washington. (1, 2) Ecology of the marine life of Puget Sound; insect life of Puget Sound Basin. (3) Wash., Alaska, Japan, Russia, Bermuda. (5) Marine Invertebrates, insects, particularly Coleoptera and Hymenoptera (can identify local forms).

\*KINDLE, EDWARD M., Victoria Museum, Ottawa, Canada.

Invertebrate Paleontologist, Canadian Geological Survey. (1) Relationship of bottom deposits to marine faunas of Bay of Fundy. (2) Lake Ontario molluscan fauna. (3) Eastern Canada. (7) Marine dredge, Albatross sampler, etc.

KIRKWOOD, J. E., University of Montana, Missoula, Mont. Professor of Botany (Ph.D.). (1) Notes on the vegetation of northwestern Ore. The influence of preceding seasons on the growth of yellow pine. The growth of guayule (*Parthenium*) in relation to the soil. (2) The conifers of Montana and the northern Rockies, Forest distribution in Montana. (3) Salt marshes of Onondaga Lake, Syracuse, N. Y.; Mont. (4) Ore.; northern Idaho; southern Ariz.; central Mexico. (6) Plantations and nursery, seeding. (7) Thermograph, hygrograph.

KLUGH, A. B., Queen's University, Kingston, Ontario (M.A.). (1) Sand dunes of Lake Ontario; plant ecology of southern New Brunswick; plant ecology of Georgian Bay; leaves of halophytes; birds of Georgian Bay; fresh water and marine algae. (2) Animal ecology. Leaves of *Carices* in relation to environment. (3) Ontario, particularly the Georgian Bay region; southern New Brunswick; Vancouver Island, B. C. (4) Mainland of British Columbia; Canadian Rockies. (5) Spiders, galls, fresh-water Mollusca, *Canadian birds, mammals and amphibia*. (6) Measurements of osmotic pressure. Measurements of reaction and discrimination time. (7) Plankton Net, deep sea bottle, deep sea thermometer, camera.

KOFOID, CHARLES ATWOOD, University of California, Berkeley, Cal. (A.B., A.M., Ph.D., Sc.D.). (1) Plankton of Illinois River. (2) Plankton of the Pacific. Relation of parasitic Protozoa to hosts. Soil Protozoa. (3) Ill., Cal., Pacific Ocean. (5) Protozoa. (6) Culture of Protozoa. (7) Plankton nets.

KORSTIAN, CLARENCE F., Forest Service, Ogden, Utah (B.Sc., M.F.). (1) Permanent sample plot studies in central California. (2) Meteorological study of forest types. Vegetation of forests of Ariz. and N. M. (3) Cascades of Wash.; Pa., N. J.; Sierra Nevadas of Cal.; Ariz., N. M., eastern Neb. (4) Rockies of Colo., Forests of Ark. (5) Forest trees. (6) Measurement of physical factors of the habitat. (7) Meteorological and forest mensuration instruments.

KRAUCH, HERMAN, Porvenir, N. M. Forest Examiner, U. S. Forest Service (B.S.F.). (2) Forest ecology. (3, 4) Southern U. S. (5) Gymnosperms. (6) Field work, vegetation studies, quadrats, transects. (7) Photometer, psychrometer, geotome.

LAMB, WILLIAM HARRISON, National Press Club, Washington, D. C. In charge of Forest Distribution, U. S. Forest Service (B.Sc.). (1) Botanical and commercial range of trees. (2) Forest geography of North and South America. (4) Atlantic to Pacific, especially between latitudes 35° and 45° N. (5)

*Pinus*, *Abies*, *Ceanothus*, but identify all arborescent plants for the Forest Service.

•LARSEN, JULIUS ANSGAR, Priest River Experiment Station, Priest River, Idaho (B.A., M.F.). (1) Silvical notes on western larch. Forests and soils of Caldwell Parish, La. Seed-spot method of sowing yellow pine. (2) Study of climatic factors in forest types in northern Idaho and U. S. F. S. District 1 for three years. Reforestation experiments at Priest River. (3) Northern Idaho, northwestern Mont. (4) Mont., Idaho, Conn. (5) Conifers, shrubs. (6) Reforestation; seed testing; determination of climatic factors for forest types. (7) Photometer, thermometer, psychrometer, atmometer, sunshine recorder, geotome; soil sampling, seed testing apparatus.

LARUE, CARL D., Department of Botany, Syracuse, N. Y. Instructor in Botany (A.B., A.M.). (2) Physiological ecology. Work in progress on epidermal appendages. Xeromorphy. (3) Ann Arbor, Mich. (4) Syracuse, N. Y. (6) Photometry.

LAWRENCE, WILLIAM E., 2475 Jackson St., Corvallis, Ore. Assistant Professor of Botany, Oregon Agricultural College (B.S.). (2) Problems of geographic distribution. Ecological successions and distribution in relation to geology and to climatic factors. (3) Mich., Ind., Ill., Wash., Ore., Okla., Alberta, British Columbia. (4) Southern Canada west of Calgary; Ore., Wash., Mich., Ind., Ill., Mass., Okla., Colo., Cal., the Southwest. (5) Algae, hepaticae, lichens, *Gymnosperms*, grasses. (6) General survey work. (7) Photographic methods.

LEATHERS, ADELBERT LLEWELLYN, Olivet College, Olivet, Mich. (Ph.B.). (2) Aquatic insects. (3) Huron Co., Mich.; Woods Hole and Worcester, Mass.; Ithaca, N. Y. (4) Woods Hole, Mass.; Ithaca, N. Y.; Huron Co., Mich.; Ann Arbor, Mich.; Toledo, Ia.; Evanston, Ill.; Bucksport, Me. (5) Chironomidae.

LEWIS, FRANCIS JOHN, University of Alberta, Edmonton, Alberta, Canada. Professor of Biology (D.Sc., F.R.S.E., F.L.S.). (1) Distribution of vegetation; vegetation maps of Northern Britain; induced changes of osmotic pressure in plants; successive floras of peat areas; relation of vegetation to the glacial epoch. (2) Distribution of vegetation types in northwest Canada, and physiological problems dealing direct with ecology. (3) The British Isles, Iceland and Canada. (4) Canadian Rocky Mts. in Province of Alberta; Vancouver Island south.

LIPMAN, CHARLES B., Rudd Hall, Berkeley, Cal. Professor of Soil Chemistry and Bacteriology. University of California (M.S., Ph.D.). (1) Ecology and the new soil fertility. (2) The effect of the soil's constitution on plant associations.

LIVINGSTON, BURTON EDWARD, Laboratory of Plant Physiology, Johns Hopkins University, Baltimore, Md. Professor of Plant Physiology and Director of Laboratory of Plant

Physiology (Ph.D.). (1) Descriptive plant geography. Plant physiology as a basis for ecological studies. Environmental conditions and their influence on plants. (2) The last two of above topics, especially the relation between plants on the one hand and climates and soils on the other. (3) Mich., Ill., Ind., N. Y., N. J., Ariz., N. M., Md. (4) Fla., Tex., Switzerland, Tyrol, Northwest Germany. (6) Measurement of temperature, soil moisture, evaporation, light intensity, transpiring power of plants. (7) Those implied in last statement and apparatus for determining physical character of soils.

LLOYD, FRANCIS ERNEST, McGill University, Montreal, Quebec. MacDonald Professor of Botany (M.A.). (1) Topography and distribution; climate and secretion (india-rubber and resin); transpiration; temperature relations; isolation. (2) Transpiration; abscission; temperature relations; local distribution. (3) N. M., Ariz., Cal., W. Tex., Ore., Ala., S. La. (4) Pacific Slope, from Alaska southward; Ore., southwestern U. S., Tex., eastern Canada. (5) *Lycopodium*, *Parthenium*. (6) Transpiration, stomatal estimation. (7) Potometer, stomatoscope, atmometer, surveying and meteorological instruments.

LONG, FRANCES, Botany Department, University of Minnesota, Minneapolis, Minn. Instructor in Botany (B.A., B.Sc., M.A.). (2) Insect pollination. (3) Pike's Peak region, Colo.; Estes Park, Colo.; Tuolumne Meadows, High Sierra, Cal. (4) Central Neb., Minneapolis.

LONG, WILLIAM HENRY, 202 Korber Building, Albuquerque, N. M. Forest Pathologist for District No. 3, U. S. Forest Service (A.B., A.M.). (1) Forest tree fungi. (2) Forest tree fungi, with especial reference to the environmental factors governing the rotting of brush from felled coniferous trees. (3) Ala., Ariz., Ark., Cal., Fla., Ga., La., Mass., N. J., New Mex., N. Y., N. C., Okla., S. C., Tex., and Va. (5) Uredinales, *Polyporaceae*, Gasteromycetes. (6) Methods for determining the reaction of wood rotting fungi to their environment, especially to heat and moisture.

LOWE, JOHN N., 458 Biology Building, Madison, Wis. Instructor in Zoology (A.B., A.M., Ph.D.). (1) The birds of Green Lake Co., Wis. (2) Growth and distribution of oysters. On the age of fishes as determined by scale ring, and the distribution of these (in year classes) in the Wis. lakes. (3) Ripon, Wis.; Berkeley, Cal.; Madison, Wis. (4) Barnegat, N. J. (5) *Fishes* and spiders. (7) Fish nets and apparatus used in the collecting of fish. Deep sea thermometers.

LYNDE, CARLETON JOHN, Macdonald College P. O., Quebec, Canada. Professor of Physics (Ph.D.). (1) On osmosis in soils; on the capillary lift of soils. (2) Soil physics.

\*McADIE, ALEXANDER, Blue Hill Observatory, Readville, Mass. Professor, Harvard University. (1) Rainfall of Cali-

fornia. (2) Evaporation. (3, 4) Cal., New England. (6) Various meteorological methods. (7) Wind, rain, and cloud recorders, etc.

MACBRIDE, J. FRANCIS, Gray Herbarium, Cambridge, Mass. Assistant, Gray Herbarium (A.B.). (2) Plant succession; soils as a factor of distribution; the formation of natural meadow lands. (3) Rock River, Wyo. (4) Idaho, adjacent Nev., Los Angeles and vicinity in summer. (5) Borraginaceae; flora of Idaho, Ore., and Wash.

MCCALL, A. G., Maryland Agricultural College, College Park, Md. Professor of Agronomy (B.Sc.). (2) Soil physics. (4) Ohio. (6) Measurement of physical constants of soils. (7) Electrical thermometer and electrolytic bridge.

MCCALLUM, W. B., 4254 Ibis St., San Diego, Cal. Botanist, Intercontinental Rubber Co. (Ph.D.). (1, 2) Ecology of Parthenium. (3, 4) Southwestern U. S., northern Mexico.

MACCAUGHEY, VAUGHAN, College of Hawaii, Honolulu, Hawaii. Professor of Botany. (1) Plant formations and ecologic factors in the Hawaiian Islands. (2) Ecologic zonation of Hawaiian plant formations. (3) Hawaiian Archipelago, Hawaii, Maui, Molokai, Oahu, Kauai. (4) San Francisco Bay region; Southern Ohio; Pittsburg, Pa., region; N. Y.; N. M. (55) Tropical and subtropical spermatophytes. (6) Plant physiological. (7) Camera, aneroid, precision thermographs.

\*MCCOLLOCH, JAMES W., State Agricultural College, Manhattan, Kans. Assistant Entomologist (B.S.). (2) Relation of climatic conditions to insect life. Economic entomology. (3, 4) Kans. (5) Coleoptera, Thysanoptera. (6) Study of life history of insects. (7) Thermographs and other meteorological instruments.

MACDOUGAL, D. T., Desert Laboratory, Tucson, Ariz. Director, Department of Botanical Research, Carnegie Institution of Washington. (1) Re-vegetation and successions of Salton Sea beaches; soil temperature. (2) Problems in Sonoran and Mohave deserts. (3) Ariz., Cal. (4) Pima Co., Ariz. (5) Cacti, Scrophulariaceae. (6) Measurement of growth and transpiration. Survivals, dissemination. (7) Soil thermograph, potometer.

MCDUGALL, W. B., University of Illinois, Urbana, Ill. Instructor in Botany (A.B., Ph.D.). (1) Mycorrhizas of forest trees. Root growth of forest trees. (2) Mycorrhizas, ecology of fleshy fungi. (3) Mich., Ill. (4) Central Mich. (5) *Agaricaceae*; *Polyporaceae*; *Hydnaceae*; *Gasteromycetes*. (6) Direct observation in the field on root growth and mycorrhiza formation.

MACGILLIVRAY, ALEXANDER D., 603 W. Michigan Ave., Urbana, Ill. Associate Professor of Systematic Entomology, University of Illinois. (1, 2) Systematic entomology. (4) N. Y., Ill. (5) Tenthredinoidea.

McLEAN, FORMAN T., University of the Philippines, Los Baños, P. I. Instructor in plant physiology, College of Agriculture (Ph.D.). (1) Relation of climate to plant growth in Maryland. (2) Effect of climate and soil moisture on growth of plants, particularly forest trees. (3) Idaho, Utah, Gulf coast swamps of La., Md., Philippine Ids. (4) N. J., Conn., Ala., Piedmont plateau. (6) Plant cultures with controlled soil conditions; comparison of measured growth of native plants to recorded weather conditions; sample plot and quadrat studies of plant distribution. (7) Soil and air thermometers, air thermographs, sunshine recorders, Clements photometers, black and white atmometers, hygrographs, rain gauges, soil samplers.

MALLOCH, J. R., State Laboratory of Natural History, Urbana, Ill. Assistant Entomologist. (2) Invertebrate ecology. (3) Scotland, Alberta, Eastern and Central States. (4) Formosa, Central and South America. (5) *Diptera, Hymenoptera—Aculeata*, particularly *immature* stages of *Diptera*.

MARCOVITCH, SIMON, University Farm, St. Paul, Minn. Assistant Entomologist (B.S.). (1) Juniper berry insects; larch seed *Megastinus*; red rose beetle. (2) Weed insects; strawberry and raspberry insects. (3) Ithaca, N. Y.; St. Paul, Minn. (5) Aphididae, Chalcidoidea. (6) Cage breeding of insects. (7) Level, transit.

MATTOON, WILBUR REED, Forest Service, Washington, D. C. Forest Examiner, U. S. Forest Service (B.A., M.F.). (1) Life history of shortleaf pine, and of southern cypress. (2) Southern pines and cypress. (3) Atlantic coast, Gulf states. (4) Southern Rockies, N. M., Ariz. (5) *Pinus*, *Taxodium*, *Juniperus*. (7) Hypsometers, calipers, climatological instruments.

METCALF, Z. P., Agricultural and Mechanical College, West Raleigh, N. C. Professor of Zoology and Entomology. (1) State list of the Homoptera. (2) Ecological relations of the Homoptera of North Carolina. Animal ecology of Lake Raleigh. Ecological relations of *Sphenophorus* and *Bruchus* (Coleoptera). Insect ecology of the North Carolina Banks. (3) Raleigh, N. C. (4) Southern Appalachians; Banks of N. C. (5) Insects (*Homoptera*), *Arachnida*, *Protozoa*.

MICHAEL, ELLIS L., Scripps Institution for Biological Research, La Jolla, Cal. Zoological and Administrative Assistant (A.B., M.S.). (1) Vertical migration in relation to variation in light, temperature, salinity, etc. Distribution of Michigan fishes. (2) All, so far as they relate to biology. (3) Coast of California from Pt. Conception to Coronado Ids. for 100 mi. westward; inland waters of Mich., for fishes in particular. (4) Oceans in general, San Diego region. (5) *Chaetognatha*, *Ctenophora*, *Salpae*. (6) Field and laboratory methods. (7) Plankton nets, water bottles, thermometers, photometers, sounding tubes, bottom testers, hydrometers.

MITCHELL, J. ALFRED, Experiment Station, Quincy, Cal. Director, Feather River Experiment Station, U. S. Forest Service (B.S. Forestry). (2) Forest ecology. (3) Sierra Nevada Mts. (4) S. Cal., Cal. coast mts., Mich. (5) Trees and shrubs.

MOORE, BARRINGTON, 925 Park Ave., New York, N. Y. (B.A., M.F.). (1) Relation of forests to environments; soil moisture; forest succession; relation of forestry to science. (2) Relation of land vegetation, particularly forests, to environment; the physiological relation between vegetation and its environment. (3) Western U. S., northeastern U. S. (4) Western U. S., New England, eastern N. Y., southeastern U. S. (4) *Conifers*, all trees, some shrubs. (5) Measurement of environmental factors; general forestry methods; physiological experimentation, especially in transpiration. (6) Instruments for soil moisture and climatology.

MOORE, J. PERCY, University of Pennsylvania, Philadelphia, Pa. Professor of Zoology. (1) Papers on birds, fishes, batrachians, reptiles, and especially annelids. (2) General ecological relations of leeches, chaetopods and batrachians. (3) Eastern Pa., N. J., New England coast. (5) *Hirundinea*, *Polychaeta*, and *Oligochaeta*. (6) Experimental embryology and controlled conditions.

MORSE, ALBERT P., 10 Upland Road, Wellesley, Mass. Curator of Zoology Museum, Wellesley College; Curator of Natural History, Peabody Museum, Salem, Mass. (1) Distribution of North American Acridiidae (locusts). (2) Ecology of insects. (3) Faunistic work in New England, Gulf states, Va. to Tex.; Pacific coast from Victoria to San Diego. (7) Collecting appliances.

MUNGER, THORNTON T., Forest Service, Portland, Ore. (A.B., M.F.). (1) Shall the physical conditions or the dendrological mixture be the basis for forest typing?; Replacement of yellow pine by lodgepole pine on the pumice soils of central Oregon, etc. (2) Forest flora of the Pacific Northwest. (3) Pacific Northwest. (4) New England. (5) *Conifers* of the Pacific Northwest. (6) Forest type mapping; permanent sample plot measurement and description. (7) Forester's instruments.

MUNNS, EDWARD N., Seven Oaks, Redlands, Cal. Director, Converse Experiment Station, U. S. Forest Service. (2) Ecology of forests and chaparral in southern California. (3) Southern Cal. (4) Cal.

MUTTKOWSKI, RICHARD ANTHONY, Biology Bldg., University of Missouri, Columbia, Mo. (A.B.). (1) Relations of insects to environment. (2) General limnology; aquatic insects; respiration of insects, especially aquatic forms. Distribution of lake fauna; fish food relations; quantitative distribution of insects in lakes. (3) Milwaukee and vicinity; Mississippi river at Wis. boundary; Madison, Wis. (4) St. Paul, Minn. and vicinity;



lakes of Wis. (5) Insects; aquatic animals, especially insects; Neuropteroid insects, particularly *Odonata*. (6) Current reactions; change of environment; field work with lights on insects. (7) Field collecting apparatus; nets and dredges.

NEWELL, ANNA GRACE, Smith College, Northampton, Mass. Assistant Professor of Zoology (M.A., Ph.D.). (3) Wolf Lake, Ind. (4) Mass. (6) Seasonal and other changes of migrations in insects.

NICHOLS, GEORGE E., Osborn Botanical Laboratory, Yale University, New Haven, Conn. Assistant Professor of Botany (B.A., Ph.D.). (1) Vegetation of Connecticut; Evaporation in Connecticut. (2) Vegetation of Connecticut; Vegetation of Cape Breton Id. (3) Conn., Cape Breton, Chicago. (4) Various parts of U. S.; Jamaica. (5) Mosses—have no time to identify specimens. (6) Atmometer.

OBERHOLSER, HARRY C., National Museum, Washington, D. C. Assistant Biologist, Biological Survey (A.B., M.S.). (1) Life zones, geographical distribution. (2) Life zones; associations and interrelations of animals and plants; geographical distribution. (3) Nev., Tex., Neb., O., N. C., Md., D. C., Va., Pa., N. Y. (4) North America, Central America, South America, Africa, Asia, East Indies. (5) *Birds of the world*.

OGILVIE, IDA H., Barnard College, New York, N. Y. Associate Professor of Geology, Columbia University (Ph.D.). (1, 2) Composition of soils, and the processes forming them. Application of ecological methods and results to the study of faunas of past geological periods. Effect of the uplift of the Isthmus of Panama on marine life. Interpretation of climate in past geological periods by chemical and microscopic comparisons between the land deposits of past periods and present soils formed in various climates. (3) Physiographic work in N. Y., Me., N. M., British Columbia, Greece, Asia Minor. (4) U. S., Canada, Mexico, France, Italy, Greece, parts of Turkey, Bermuda. (6) Clinometer, Locke level, plane table.

ORTMANN, A. E., Carnegie Museum, Pittsburg, Pa. Curator, Invertebrate Zoology, Professor of Physical Geography, University of Pittsburg. (1) Ecology and distribution of Crayfishes of Pennsylvania; papers on geographical distribution of various groups. (2) Geographical distribution of North American freshwater faunas, with reference to ecology and origin. (3) Alleghanies from Pa. to Tenn. (4) Shores of Lake Erie in Pa.; Piedmont Plateau from N. J. to Va. (5) *Freshwater Crayfishes* (Cambarus), *Freshwater Mollusks*, *Freshwater Gastropods*. (7) Collecting apparatus.

OSBORN, HERBERT, Ohio State University, Columbus, O. Professor of Zoology and Entomology. (1) Grain and grass insects. Insects affecting domestic animals. Ecological phases of Homopterous insects. (2) Associations of insects on lake beaches.

Associations of animals in pastures and meadows. Parasitic relations of animals, especially insects. (3) Lake Erie near Sandusky, O., faunistic and ecological studies in Homoptera of United States, especially O. and Me. (4) Mexico; portions of Canada. (5) Hemiptera, Mallophaga, Pediculidae and in *Homoptera*, especially *Jassidea* of the Nearctic Region. (6) Rearing or breeding, with incidental work on parasitic or predaceous relationships. (7) Collecting and breeding appliances.

OSBURN, RAYMOND C., Connecticut College for Women, New London, Conn. Professor of Biology (M.Sc., Ph.D.). (1) Survey of the Woods Hole region. Dragonflies in brackish water. Numerous papers on aquatic animals. (2) Aquatic biology, especially marine. Aquatic life of Porto Rico. Bryozoa. (3) Woods Hole. (4) Central and northern O., Canadian Rockies, Atlantic Coast. (5) *Fishes*, *Bryozoa*. (7) Collecting apparatus. Dredge, sounding and temperature apparatus.

OVERTON, JAMES BERTRAM, University of Wisconsin, Madison, Wis. Professor of Plant Physiology (Ph.D.). (1, 2) Plant physiology.

\*PALMER, E. LAWRENCE, Iowa State Teachers College, Cedar Falls, Iowa. Professor of Botany (A.B., M.A.). (2) Fish distribution. Seed dissemination. (3) Ithaca, N. Y.; Cedar Falls, Iowa. (4) Ontario, Iowa, N. Y. (5) Seeds of weeds.

PAMMEL, L. H., Iowa State College, Ames, Iowa. Professor of Botany (Ph.D., B.Agr.). (1) Plant ecology. Phytogeography. Peat bog floras. (2) The distribution of forest trees in relation to soil. (3) Iowa, Wis., Utah, Mont. (5) *Grasses*, *trees*.

PARISH, S. B., 772 North D. St., San Bernardino, Cal. (1) Several papers relating to the ecology of southern California. (2) Ecology of southern California. (3) Several parts of southern California. (4) Other portions of California. (5) Interest is regional; will identify seed plants of southern California.

PARKER, GEORGE HOWARD, 16 Berkeley St., Cambridge, Mass. Professor of Zoology, Harvard University (D.S.). (1, 2) Analysis of animal reactions. (5) Vertebrates. Coelenterates. (6) Those concerned with sensory stimulation.

PEARSE, A. S., University of Wisconsin, Madison, Wis. Associate Professor of Zoology (Ph.D.). (1) Marine beaches. Various invertebrates. (2) Interested in all aspects of ecology; working on ecology of fishes of lakes. (3) Mass., Mo., Wis., Mich., South America, Philippine Ids. (4) Wis., and above localities. (5) *Crustacea*; fishes. (6) Field observations (gas analysis, temperatures, etc.).

PEARSON, GUSTAF A., Flagstaff, Arizona. Director, Fort Valley Experiment Station, U. S. Forest Service (B.S., M.A.). (1) Reproduction in western yellow pine. Artificial reforestation. Revegetation of denuded range areas. Influence of the forest on climatic and ecological factors. Methods of studying

the light requirements of trees. (2) Reproduction and development of forests. Study of habitat factors in different plant formations. (3) Ariz., N. M., northeastern Ore. (4) Atlantic and Pacific coast regions, southern states. (6) Measurement of physical factors, quadratting and charting vegetation. (7) Meteorological and soil instruments, evaporimeters, photometers.

\*PEPOON, H. S., Lake View High School, Chicago, Ill. Teacher, Lake View High School (M.D.). (3) Chicago region; southwestern Mich.

\*PERKINS, HENRY F., University of Vermont, Burlington, Vt. Professor of Zoology (Ph.D.). (1) Distribution of *Goniomemus murbachii*. Medusæ of Tortugas. Mollusks of Lake Champlain. (2) Fishes of Lake Champlain. Tubifex. (3) Atlantic coast, Lake Champlain. (5) Fishes, Medusæ, Oligochæta. (6) Food determinations. Rearing parasites. (7) Plankton apparatus.

PERRY, EDNA M., 910 French St., Santa Ana, Cal. (A. B.). (1) Distribution of marine shore animals. (2) Animal distribution, especially marine life. Nesting habits and food of young in birds. Vesper sparrow and hermit thrush. (3) Friday Harbor, Wash.; Douglas Lake, Mich. (5) Mollusca, Arthropoda, Echinoderms, Ants. (6) Effects of temperature, light and heat on marine forms.

PETERSON, J. L., Forest Service, Wallowa, Wash. Assistant Forest Ranger in charge of Range Reconnaissance. (2) Quadrat and transect work on vegetation. Nature, relations and specific composition of plant formations. Plant migration, invasion, succession and competition. (3) Wallowa and Minam National Forests, Oreg.; Targhee National Forest, Idaho. (4) Umatilla National Forest, Oregon. (5) Grasses.

PETRY, EDWARD J., 267 Wood St., Lafayette, Ind. Instructor in charge of Agricultural Botany, Purdue University (B.Sc., M.Sc.). (2) Change of plant societies due to drainage; Rotation of dominant forms. (3) Ithaca, N. Y.; Tuscarawas Co., O.; Lafayette, Ind. (4) O., Pa., W. Va., southern Lake Michigan. (5) Angiosperms, Fungi (6) Isolation and culture of fungi; chemistry of nutrition of cultivated Angiosperms. (7) Climatological instruments, transit, aneroid, camera.

PHILLIPS, EVERETT FRANKLIN, Bureau of Entomology, Washington, D. C. In charge of bee culture investigations (A.B., Ph.D.). (1) Numerous papers on bees. (2) Response of the honey bee to climatic conditions, especially water conditions. (4) Most of U. S., Hawaii, Porto Rico. (5) *Apis mellifica*. (6) Measurement of reactions to changes in temperature, humidity, etc.

PICKETT, F. L., Washington State College, Pullman, Wash. Associate Professor of Taxonomy and Ecology (Ph.D.). (1) Resistance to desiccation by mosses and ferns. Effect of changed

light intensity on development of fern prothallia. (2) Special adaptations of plants of arid or semi-arid regions and their importance in determining distribution. (3) Ind., Wash.

PIEMEISEL, ROBERT LOUIS, Bureau of Plant Industry, Washington, D. C. (B.A.). (1) Indicator significance of vegetation in Utah (joint author). (2) Indicator significance of vegetation. (3) Tooele Valley, Utah; Salton Sink, Cal.; Milford, Utah; Chandler, Ariz.; Northern Minn. (4) Akron, Colo.; Riverside, Cal.; Southern Minn.; Northern Minn. (6) Correlation of vegetation with soil alkalinity or soil moisture. (7) Instruments used in measuring habitat factors; electric bridge for alkali readings; photometer; psychrometer.

PIERCE, WILLIAM DWIGHT, Bureau of Entomology, Washington, D. C. Entomological Assistant (A.B., M.A.). (1) Relation of cotton boll weevil to parasites and environmental conditions. Monograph of Strepsiptera, with emphasis on host relationships. Relation of temperature and humidity to insect development. Host relations of Hypermetamorphic beetles. (2) Insect parasitism. Climatic control of insect life. (3) Neb., Tex., Ariz., La., Ark., Okla., Miss., Ala., Ga., Tenn., Fla., S. C., D. C. (4) The cotton belt. (5) *Strepsiptera* of the world. *Rhynchophora* and *Rhipiphoridae* of North America (plenty of time needed for determination). (5) The technique of parasite breeding. (6) Thermometers, thermo-hygrograph, sling psychrometer.

POOL, RAYMOND J., University of Nebraska, Lincoln, Neb. Professor of Botany and Acting Head of Department (A.M., Ph.D.). (1) Prairie problems. (2) Problems of the prairie and border woodlands of the middle west. (3) Neb., Colo. (4) Mich., Wis., Minn., Ill., N. M., Iowa, S. D., Kas. (5) *Grasses*, sedges, *composites*, fungi. (6) Water content determinations including humidity, evaporation, light, photographic methods. (7) Commoner ones.

POUND, ROSCOE, 490 Pleasant St., Belmont, Mass. Dean of Harvard Law School; Sometime Director of the Botanical Survey of Nebraska (Ph.D., LL.D.). (1) Vegetation of Nebraska. Phytogeography of Nebraska (with F. E. Clements). (2) No work now in progress (3) Neb., prairies and sandhills. (4) Apostle Ids., southern Wyo., northern Ga. (5) Fungi Imperfecti. (6) Field methods employed in Botanical Survey of Nebraska. (7) Most of those described in Clements' Research Methods.

POWERS, EDWIN B., University of Illinois, Urbana, Ill. Professor of Biology, Trinity University, Waxahachie, Tex. (on leave of absence) (A.B., M.S.). (1) The reactions of crayfishes to gradients of dissolved carbon dioxide and acetic and hydrochloric acids. Experimental study of the movements of herring and other marine fishes (with V. E. Shelford). (2) Crustacea

as an index organism. (3) Vicinity of Chicago and Urbana, Ill.; Friday Harbor, Wash. (4) Ill., Wash., central Tex. (5) Crustacea. (6) Determining the response of animals to their physiological environment by means of gradients; oxygen requirement and consumption of aquatic animals, by oxygen determination methods. (7) Marine dredges and trawl and plankton nets.

PRAEGER, WILLIAM E., Kalamazoo College, Kalamazoo, Mich. Professor of Biology. (1) Plant associations. Habits of birds. (3) Mich., Ill. (4) Utah, Mont., Ireland. (5) Flowering plants, Vertebrates.

QUICK, BERT EDWIN, Southwestern College, Winfield, Kas. Professor of Botany (A.B., Ph.D.). (1) Descriptions of local associations. (2) Phytogeography. Comparative study of climax associations in southern Michigan. (3) Mich. (lower peninsula). Buitenzorg, Java. (4) Mich., Ill., Iowa, Manitoba, San Francisco regions, Philippines, Borneo (north), Java, Ceylon. (5) Ericaceae. (6) Quadrat and transect methods. (7) Photometer, evaporimeter, atmometer.

RAMALEY, FRANCIS, University of Colorado, Boulder, Colo. Professor of Biology (Ph.D.). (1) Plant ecology. (2) Dry grassland; lake and streamside vegetation; alpine vegetation. (3) Colo. (4) Minn., Cal. (5) Seed plants. (6) Observational methods; quadrat studies; transects; study of physical factors. (7) Plane-table, atmometer, actinometer, thermometer, barometer, psychrometer, soil borer, etc.

\*RAU, NELLIE L., 4932 Botanical Ave., St. Louis, Mo. (1) Life histories of insects. (2) Behavior of digger wasps. (3) Mo.

RAU, PHILIP, 4932 Botanical Ave., St. Louis, Mo. (1) Insects.

REED, GUILFORD G., Queen's University, Kingston, Canada. Assistant Professor of Botany (Ph.D.). (1) Salt marshes and peat formation. (2) The relation of oxygen and acids to plants; the condition of these in soils. (3) Salt marshes of the Atlantic coast, U. S. and Canada. Bogs of Ontario. (6) Oxygen and acid determinations. (7) Gas chains, acid indicators, Winklers apparatus.

REIGHARD, JACOB, University of Michigan, Ann Arbor, Mich. Professor of Zoology (Ph.D.). (1) Ecology and breeding habits of freshwater fishes; coloration of coral reef fishes. (2) Breeding habits of fresh-water fishes. (3) Washtenow Co., Mich.; Tortugas, Fla. (4) Great Lakes. (5) Fresh-water fishes. (6) Field experimentation. (7) Plankton apparatus; underwater photography.

RICHARDSON, ROBERT E., State Laboratory of Natural History, Urbana, Ill. Biologist in charge of Illinois Biological Station (A.M.). (1) Bottom and shore fauna and plankton of

Illinois River (with S. A. Forbes). (2) Fresh-water fishes; bottom and shore fauna; plankton; sewage organisms. (3) Illinois and Fox rivers, Ill. (4) Mississippi and Ohio rivers. (5) Fishes; fresh-water algae; fresh-water plankton.

RIGG, GEORGE B., University of Washington, Seattle, Wash. Assistant Professor of Botany (B.S., A.M., Ph.D.). (1) Peat bogs. Forest distribution. Ecology of large kelps. (2) Toxicity of bog habitats, forest succession in bogs. Ecology of large kelps. (3) Puget Sound region, Alaska. (4) Iowa, Ill., Minn. (5) Ericaceae. (6) Physiological experiments.

RILEY, C. F. CURTIS, State Normal College, Milwaukee, Wis. Head of Department of Biology and Nature Study (A.B., B.S., A.M., M.S.). (1) Behavior. Light and contact responses of dragon-fly nymphs, young crayfishes and young toads, and relation of these organisms to aquatic environment. Relation of dragon-fly nymphs to running water. (2) Relation of water striders to running water and modification of their "habits" by such environment. (3) Ann Arbor, Mich., Urbana, Ill. (4) Southeastern Neb., Denver, Colo. (5) Aquatic Hemiptera, dragon-flies, amphibians. (6) Laboratory methods on light and contact. Behavior. Outdoor observations on effects of currents on aquatic Hemiptera.

ROBBINS, W. W., Agricultural College, Fort Collins, Colo. (1, 2) Plant ecology.

ROBERTS, EDITH A., Dover, N. H. (Ph.D.). (1) Plant societies of the Mt. Holyoke region. The distribution of beach plants. (2) Experimental ecological work on root-hairs. (3) Mass. (4) N. H., Mass.

ROBERTS, PAUL H., Forest Service, Albuquerque, N. M. Forest Ranger (B.Sc.). (2) Grazing reconnaissance. The study of the factors controlling the distribution and growth of range plants. (3) Huachuca and Santa Rita Divisions of Coronado National Forest, Ariz. Coconino and Sitgreaves National Forests, Ariz. (4) Region near Ephraim, Utah. Sandhill region of Neb. (6) Quadrat method of studying vegetation. (7) Thermograph, photometer, geotome, soil thermometer and other climatological instruments.

ROBERTSON, CHARLES, 305 Orient St., Carlinville, Ill. (Hon.M.S.). (1, 2) The relations between plants and insects. (3, 4) Carlinville, Ill.; Orlando and Inverness, Fla. (5) Entomophilous plants and anthophilous insects.

ROE, MABEL LEWIS, Margaret Morrison School, Carnegie Institute of Technology, Pittsburgh, Pa. Instructor in Botany (Ph.D.). (2) Experimental and physiographic ecology. (3, 4) Chicago region.

ROMER, CAROLINE, 154 Second Ave., Newark, N. J. Head of Biology Department, Barringer High School (Ph.B.). (2)

Mountain plant ecology. (3) Selkirks and Canadian Rockies. (4) Northern and coastal N. J., Chicago region.

ROSENDAHL, C. O., University of Minnesota, Minneapolis, Minn. Professor of Botany (Ph.D.). (1) Plant distribution in Renfrew District, Vancouver Island. Geographical distribution of North American Saxifragaceae. (2) Phytogeographical studies in Minnesota. (3) Vancouver Id., Minn. (5) *Saxifragaceae*, *Betulaceae*, *Rosaceae*, *Araceae*.

RUTHVEN, ALEXANDER G. Museum of Zoology, University of Michigan, Ann Arbor, Mich. Professor of Zoology; Director of the Museum of Zoology (B.S., Ph.D.). (1) Habitat distribution in its effects upon geographical distribution. (2) Ecological distribution of Amphibians and reptiles. (3) Various parts of North America, Mexico, Colombia and Guiana. (5) *Amphibians*, *Reptiles*.

SAMPSON, ARTHUR W., Forest Service, Washington, D. C. Plant Ecologist, and Director of Utah Forest Experiment Station (B.Sc., A.M.). (1) Transpirational studies. Soil type and plant associations. Natural reseeding of range lands. Artificial reseeding of range. The quadrat as related to plant succession. (2) Natural succession. Relation of plant growth to various mountain climates. (3) Ore., Cal., Ariz., Idaho, Utah, Colo., N. M. (4) Western U. S. (6) Quadrat successional methods. (7) All of the common meteorological instruments; physical soil instruments, etc.

SAMPSON, HOMER C., Department of Botany, University of Chicago, Chicago, Ill. (B.S.). (2) An ecological survey of the Illinois prairies. (3, 4) Chicago region. (6) Atmometry. (7) Atmometers.

SARVIS, J. T., U. S. Field Station, Mandan, N. D. Assistant in Dry Land Agriculture, U. S. Department of Agriculture (B.S., M.S.). (1) Composition of the vegetation in the vicinity of Mandan, North Dakota. (2) Native vegetation in relation to agricultural possibilities and grazing in the Great Plains area. (3, 4) Western S. D., western N. D. (5) Gramineae. (6) Soil moisture determinations; meteorological observations. (7) Soil moisture instruments; meteorological instruments.

SCHNEIDER, EDWARD C., 218 E. Uintah St., Colorado Springs, Colo. Professor of Biology, Colorado College (Sc.D., Ph.D.). (1) The distribution of woody plants in the Pike's Peak region. The succession of plant life on gravel slides in the vicinity of Pike's Peak. Physiological relations of mammals to high altitude. (2) Successions of plant life. Relations of man to high altitude conditions. (3) Pike's Peak region. (4) New England, middle states.

SCOTT, WILL, 731 Atwater, Bloomington, Ind. Assistant Professor of Zoology, University of Indiana. (1, 2) Limnology.

(3, 4) The lakes of Ind. (5, 6) Limnological methods and instruments.

SHANTZ, H. L., Bureau of Plant Industry, Washington, D. C. Plant Physiologist, Alkali and Drought-resistant Plant Investigations (B.Sc., Ph.D.). (1) Vegetation of Great Plains, Great Basin, and lakes of Pike's Peak region. Relation of plant growth and other plant functions to physical factors of habitat. Indicator value of natural vegetation. (2) The effect of physical factors on plant functions and structures. Indicator value of natural vegetation. Plant succession as a response to climatic or other physical or biological influence. Water as a factor in plant growth. Plant geography of the United States. (3) Western U. S., west of Neb. and Tex. (4) La., Mo., Mich., Fla., Md., Va., Wis. (5) Cyanophyceae, Phyllopoda. (6) Methods of plant survey, of soil moisture study, or salt content determinations; measurements of temperature, evaporation, radiation, saturation deficit, wind, rainfall, transpiration, etc. Available and non-available water. Soil temperatures; plant temperatures. (7) Instruments used in above determinations.

SHAW, HARRY B., 248 Custom House, New York, N. Y. Pathological Inspector, U. S. Department of Agriculture. (1) Effect of variation in light on sugar production in beets. The climatic control of seed production in beets. An improved cog psychrometer. (2) Climatic control of the morphology and physiology of beets; measurement of the factors concerned. (3) Utah, Idaho, Mich., D. C. (4) Ariz., Kas., Colo., Ind., southern Mich. (5) Chenopodiaceae. (6) Those concerned in field studies on the breeding and culture of sugar beets and sorgo, and in the measurement of factors comprising the temperature or climatic factors as influencing the morphological development of beets. (7) Air and soil thermographs, thermometers, psychrometers, anemometers, evaporation tanks, sunshine recorders, actinometers, calorimeters, photographic apparatus.

SHELFORD, VICTOR E., 506 W. Iowa St., Urbana, Ill. Assistant Professor of Zoology, University of Illinois; Biologist, Illinois State Laboratory of Natural History (S.B., Ph.D.). (1) Ecological succession of beetles, fishes, and land invertebrates. Ecological classification. Agreement in communities. Comparison of responses of sessile and motile organisms. Responses to evaporation. Physiological animal geography. Animal communities. Principles of animal ecology. Migrations of herring. (2) Conditions of existence. Physiological-habitudinal variation within a species. Relations of animals to contamination of waters. Effect of weather on growth in insects. (3) Vicinity of Friday Harbor, Wash., south end of Lake Michigan, eastern Tenn. (4) South central N. Y., southern Canadian Rockies, western Neb. and Kas., central N. M., southern Idaho, southern



Cal. (5) Fishes; insects (especially tiger beetles). (6) Rheotaxis methods; gradient tank; Yerkes light grader; evaporation gradients; control of bottom materials; water contamination methods, with fishes. (7) Field rheotaxis apparatus; porous cup atmometers; photometers; water sampling devices.

SHREVE, EDITH BELLAMY, Desert Laboratory, Tucson, Ariz. Voluntary Investigator, Department of Botanical Research, Carnegie Institution of Washington (A.B.). (1) Water relations of desert plants. (2) Water relations and internal temperatures of annuals and perennials throughout the several seasons of the southern Arizona climate. (3) Southern Ariz. (6) Transpiration measurement, including the use of cobalt paper. Leaf temperature determination. Water content of plant parts. Measurement of stomatal apertures. Soil moisture determination. (7) Porous cup atmometer, thermographs, calorimeters, balances.

SHREVE, FORREST, Desert Laboratory, Tucson, Ariz. Member of Staff, Department of Botanical Research, Carnegie Institution of Washington. (1) The relation of climatic and soil conditions to the distribution and activities of vegetation in Maryland, Jamaica and Arizona. (2) The relation of climate to vegetation in the United States. Factors controlling distribution of vegetation in the deserts of Arizona and California. Establishment of desert perennials. (3) Md., Jamaica, Ariz. (4) Long Island, N. Y., N. J., Fla., Ala., N. M., Cal. (5) Hymenophyllaceae, Cactaceae, *Aselepias tuberosa*, *Cephalanthus occidentalis*. (6) Transpiration, stomatal behavior. (7) Instruments for general climatology and soil moisture, for growth and transpiration behavior of plants; methods for estimating rate of establishment and securing vital statistics of plant populations.

SHULL, CHARLES A., University of Kansas, Lawrence, Kas. Associate Professor of Plant Physiology and Genetics (S.B., Ph.D.). (1) Physiological isolation of types in the genus *Xanthium*. Life history and habits of *Anthocharis olympia*. Mallophaga of Michigan. (2) Measurement of surface forces in soils. (3) Kas., Chicago region. (4) Central Ky., O., western Kas. (6) Physical measurements.

SHULL, GEORGE HARRISON, 60 Jefferson Road, Princeton, N. J. Professor of Botany and Genetics, Princeton University (Ph.D.). (1) Secular variation in *Aster*, related to variation in climatic factors. Geographic distribution of *Isoetes saccharata*. Longevity of seeds. (2) Genetics. (3) Upper Chesapeake Bay, Md., Cold Spring Harbor, L. I. (4) U. S., except Fla. (5) Cruciferae, Oenotherae, Lychnidae. (6) Genetical and biometrical.

SINNOTT, EDMUND W., Storrs, Conn. Professor of Botany, Connecticut Agricultural College (Ph.D.). (1) Evolution

of growth-forms, especially herbs. (2) Comparative rate of evolutionary change in various growth-forms. (4) Eastern Mass.

\*SLATER, JAMES R., Lyman Hall, Syracuse University, Syracuse, N. Y. Teaching Fellow. (2) Natural history of Urodeles and Anura. (3) Onondaga and Greene counties, N. Y. (4) N. Y., La., Colo., Wis., Ariz., Cal. (5) *Urodela*, Anura, fishes. (7) Thermometer, net.

SMALLWOOD, W. M., Syracuse University, Syracuse, N. Y. Professor of Comparative Anatomy (Ph.D.). (1) Diseases of fishes. (2) Food and diseases of fishes. (3) Adirondacks. (5) Molluscs, leeches, fishes.

SMILEY, FRANK J., Occidental College, Los Angeles, Cal. Assistant Professor of Geology and Botany. (1) The boreal vegetation of the Lake Tahoe region, California. (2) The high mountain flora of California. (4) Central and southern Sierra Nevada, central Rocky Mts., White Mts. of New England. (5) Cyperaceae (*Carex*), Juncaceae.

SMITH, E. VICTOR, University of Washington, Seattle, Wash. Assistant Professor of Zoology (M.A., Ph.D.). (1) Fishes in their relation to light. (2) Fishes and their environment. (3, 4) Puget Sound Region, Wash. (5) Salmonoid fishes. (6) Fish culture methods.

SMITH, FRANCES GRACE, Smith College, Northampton, Mass. Associate Professor of Botany (Ph.D.). (1) Red color in plants. (2) Transpiration in dune plants. Plant geography. (3) Sand dune areas near Chicago. Tropical forests of Central America. (4) Guatemala, Jamaica, northern N. M., New England.

SMITH, FRANK, 913 W. California Ave., Urbana, Ill. Professor of Systematic Zoology, University of Illinois. (1) Bird migration. Relation of Illinois birds to trees and shrubbery. Oligochaete papers dealing with habitats. (2) Plankton work. Bird migration. Habits and habitats of Oligochaeta. (3) Havana, Ill., Douglas Lake, Mich., Urbana, Ill. (5) *Oligochaeta*, *fresh-water sponges*, Mollusca. (7) Plankton equipment.

SMITH, J. WARREN, U. S. Weather Bureau, Washington, D. C. Chief of Division of Agricultural Meteorology, Weather Bureau (B.S., M.S.). (1) Relation of the weather to the yield of various crops, such as corn, potatoes, wheat, etc. Also climatic studies. (2) Agricultural meteorology; agricultural climatology. (3) Central U. S. (4) Relation of weather and crops and climate and crops in U. S. (7) Meteorological instruments.

SNOW, LAETITIA MORRIS, 6 Norfolk Terrace, Wellesley, Mass. Associate Professor of Botany, Wellesley College (A.B., Ph.D.). (1) Root-hair development. Diaphragms of water plants. Physiographic ecology of the Delaware coast. Distribution of insects in Lake Michigan drift line. (2) Ecological anatomy and experimental ecology of aquatics. Salt marshes

and undrained swamps. (3) Del. coast (10 year intervals), Woods Hole. (4) Regions near Ithaca, N. Y., Chicago, Ill., Wellesley, Mass., Baltimore, Md., Farmville, Va. (5) Aquatic Angiosperms. (6) Laboratory methods for varying conditions.

SPOONER, CHARLES S., 708 N. Elm St., Urbana, Ill. (A.B.). (2) Relations of temperature and moisture to rate of insect metabolism. (3) Urbana, Ill. (5) Hemiptera, especially *Fulgoridae*, *Pentatomidae*, *Capsidae*.

STALLARD, HARVEY, 723 7th St. S. E., Minneapolis, Minn. Assistant, University of Minnesota (A.B.). Climax vegetations of Minnesota and their development (assistance). (2) Successions of Minnesota vegetation. Indicator vegetation. Life history of peat bogs. (3) Northern Minn. (4) Great Plains. (7) Quadrats, Photometer, potometer, hygrometer, thermometers, anemometer, atmometer, geotome, peat samplers, soil sieves, etc.

STARR, ANNA M., Mount Holyoke College, South Hadley, Mass. Instructor in Botany (Ph.D.). (1) Comparative anatomy of dune plants. (2) Anatomy of bog plants. (3) The dunes of the Chicago region. (4) Western Mass., northern O., Colo. (5) Bryophytes, Gymnosperms.

STEPHENS, T. C., Morningside College, Sioux City, Iowa. (1) Breeding habits of birds. (2) Field ornithology, especially behavior. Malacology, systematic and ecological. (3) Lake regions of Iowa; upper Missouri valley. (5) Aves, Mollusca, Arachnida.

STERRETT, WILLIAM D., Forest Service, Washington, D. C. Forest Examiner. (A.B., M.F.). (1) The ashes, their characteristics and management. Scrub pine. Loblolly pine. (2) Permanent sample plots for remeasurement of different kinds of forest stands to determine methods of reproduction, rate of growth, etc. (3) N. H., Vt., Mass., Conn., Md., S. C. (4) Eastern U. S., as far west as Okla. and Mo. (5) *Fraxinus*. (6) Permanent sample plots for periodic remeasurement of forest stands. (7) Caliper, hypsometer and surveying instruments.

STORER, TRACY IRWIN, Museum of Vertebrate Zoology, University of California, Berkeley, Cal. Assistant Curator of Birds (M.S.). (2) Land vertebrates. (3) West-central Cal. (4) Cal. (5) Land vertebrates of western N. A., especially California.

SUMNER, FRANCIS B., La Jolla, Cal. Biologist, Scripps Institution for Biological Research (B.S., Ph.D.). (1) Biological Survey of the waters of Woods Hole and Vicinity. (2) Distribution and local life conditions of subspecies of deer-mice (*Peromyscus*), and the plants belonging to their habitats. (3) Mass. (coast), Cal. (various land areas). (4) Cal. (5) Fishes, mice (particularly *Peromyscus*). (6) Experimental embryology; effects of solutions on fishes; color changes in fishes. Genetic work with mice. (7) Dredging and sounding apparatus. Traps for small mammals. Meteorological instruments.

TAYLOR, NORMAN, Brooklyn Botanic Garden, Brooklyn, N. Y. Curator. (1) Flora of the vicinity of New York. Pine barrens of New Jersey. (2) Phytogeographic and ecological survey of Long Island, N. Y. Phytogeography of West Indies and of New York state. (3) N. Y. (4) Region within 100 miles of New York City. (5) Ericaceae, Compositae.

TAYLOR, WALTER PENN, Biological Survey, Washington, D. C. (B.S., Ph.D.). Ecology of the higher vertebrates. The habits and distribution of *Phenacomys*. Aquatic adaptation in the carnivora as illustrated in the osteology and evolution of the sea-otter. (2) Relation of mammals to the rest of the biota and to their environment. (3) Cal., Nev. (5) Mammals, birds, reptiles, amphibians, *California mammals*. (6) Methods requiring observation of nature's own experiments. (7) Regular equipment of field naturalist.

THOMPSON, CRYSTAL, Museum of Zoology, Ann Arbor, Mich. Assistant in charge of Reptiles and Amphibians, Museum of Zoology of the University of Michigan (M.A.). (1, 2) Distribution and habits of reptiles and amphibians. (3) Mich., Nev., Ill., Tex. (4) Portions of New England. (5) *Reptiles, amphibians*.

TITUS, E. G., Agricultural Experiment Station, Logan, Utah (B.Sc., Sc.D.). (2) General survey of Logan Delta and other parts of Utah. (3) Logan Delta, Cache Valley, Uintah Mts., and other parts of Utah. (4) Utah, Ill., Cal., Idaho, Nev. (5) *Apoidea* in Hymenoptera, Genus *Phytonoma* in Coleoptera.

TORREY, HARRY BEAL, Reed College, Portland, Ore. Professor of Biology. (1) Dinoflagellata on the Pacific Coast. Hydroida of the Pacific Coast. Corymorpha and environment. (2) Survey of Reed College campus. (4) San Diego and San Francisco regions, Cal.; Portland, Ore.; San Juan Ids., Wash. (6) Laboratory methods concerning behavior of animals, especially toward light.

TOUMEY, JAMES W., School of Forestry, Yale University, New Haven, Conn. Director, School of Forestry, Yale University. (1) Silvics. (2) Forest cover as affected by all factors. (3) New Haven, Conn. Western states. (4) Nearly all parts of the U. S. (5) Indigenous trees. (7) Open tank evaporation method and porous cup.

TOWER, WILLIAM L., University of Chicago, Chicago, Ill. Associate Professor of Zoology. (1) Desert and tropical ecology. (2) Tropical and subtropical deserts. Rain-forests. (3) Deserts of Mexico, Guatemala, Costa Rica, Panama and Colombia. Rain-forests of southern Mexico and Guatemala, Panama, Colombia, Cuba, Trinidad and the Orinoco. (4) Upland savannahs and alpine regions of Central America and Mexico. (5) *Chrysomelidae*, especially *Leptinotarsa* and *Doryphora* from the standpoint of evolution. (6) Environmental action upon genetic proc-

esses. Genetics and experimental evolution. Acclimatization and adaptation to changed environment.

TOWNSEND, CHARLES H. T., National Museum, Washington, D. C. Entomological Assistant, Bureau of Entomology, U. S. Department of Agriculture, and Custodian of Muscoid Diptera, U. S. National Museum. (1) Distribution of organisms in general and insects in particular with reference to environments. (2) The exact measurement of factors of environment and response of organisms thereto, with special reference to the Muscoid Diptera; as well as the broader subject of dispersals, adjustment and distribution, especially in Muscoidea and Compositae. (3) N. H., N. M., Tex., Mexico, Ecuador, Peru. (4) N. M., Ariz., Tex., Mexico, Andean region of southern Ecuador, west coast and Andean region of Peru, montaña of Peru, White Mts. of N. H. (5) *Muscoid Diptera*. Compositae. (6) Study of species in confinement in outdoor cages. (7) Thermometer, hygrometer, photometer, barometer, camera, compass.

TRANSEAU, EDGAR NELSON, Ohio State University, Columbus, O. Professor of Botany. (1) Ecological distribution of bog plants. Succession of plant associations in Illinois, Nova Scotia, Long Island. Periodicity of freshwater Algae. Rain-fall-evaporation ratios and vegetation. Evaporation in relation to plant associations. (2) Succession of plant associations in Ohio. Experimental study of periodicity of algae. (3) Pa., Nova Scotia, L. I., Ill., Mich., Kas., Colo., central Cal. (5) Green Algae, *Zygnemales*. (7) Vaporimeters, thermographs, hygrographs, etc.

TURESSON, G. W., Disponentgatan 25, Malmö, Sweden (B.S., M.S.). (1) Slope exposure. Peat Bogs. Fungi in the alimentary canal. (2) Peat Bogs. Pathogenic fungi. (3, 4) Scandinavia; Pacific Coast of U. S. (5) *European Spermatophytes*, particularly from the northern and central parts.

TURNER, CHARLES HENRY, Sumner High School, St. Louis, Mo. (B.S., M.S., Ph.D.). (1) Relations of Entomostraca to environment. Relations of insects to environment. (2) Entomostraca, Entomology. (3, 4) Ga., Mo. (5) Entomostraca, *Cladocera*, *Ostracoda*, *Copepoda*.

VAN ESELTINE, G. P., Bureau of Plant Industry, Washington, D. C. (A.B.). (2) Plant ecology of Washington, D. C., and vicinity. (4) Central and northern N. Y., D. C. and vicinity. (5) *Carex*, *Selaginella* (rupestris group).

VESTAL, ARTHUR GIBSON, Eastern Illinois State Normal School, Charleston, Ill. Teacher of Botany (A.M., Ph.D.). (1) Plant and animal associations of sand prairie. Ecological and distributional relations of grasshoppers. Vegetation of eastern prairies (Ill.), and of plains and mountain front in Colorado. Internal relations of terrestrial associations. (2) Special interest in grassland vegetation, especially prairie. The vegetational,

geographic and community aspects of ecology. Interrelations of plants and animals. Work in progress: Phytogeography of eastern mountain front in Colorado. Grassland vegetation in northwestern Montana. Status of prairie associations in the southern dune areas of Lake Michigan. Grasshoppers of eastern Colorado. Foothills associations in Colorado. Mixed associations. (3) Ill., eastern Colo., Mich., northwestern Mont. (4) Various parts of the prairie region, Ill., Ind., Mich., Colo., Neb., Columbia Basin. (5) Coleoptera, Orthoptera. (7) Soil-borer, camera, surveying instruments.

VISHER, STEPHEN S., State Normal School, Moorhead, Minn. (Ph.D.). (1) Badlands of South Dakota. Sandhills and buttes of northwestern South Dakota. On the significance of the biota and of biogeography. (2) On the biogeography of the northern Great Plains. (3) S. D., Ill., Mich., Ariz., Jamaica. (4) Nearly all sections of the U. S. except the Great Basin. (5) Seed plants, mammals, insects, *birds*. (7) Evaporimeters, soil samplers.

WALKER, BRYANT, 1306 Dime Bank Building, Detroit, Mich. (A.B., LL.B., Sc.D.). (1) Systematic and distributional work. (2) Distribution of land and fresh-water Mollusca. (3) Region of Great Lakes; southern and western states. (5) *Land and fresh-water Mollusca* of North America. (7) Conchological instruments.

WARD, HENRY BALDWIN, University of Illinois, Urbana; Ill. Professor of Zoology (Ph.D.). (1) Fresh-water life of Lake St. Clair, Lake Michigan, Elevated Lakes, etc. Parasitology: effects, distribution, life histories, etc.- Migration of salmon. (2) Factors influencing migration of Pacific salmon. Origin of parasitic fauna of fresh-water hosts. Distribution of parasites in North America. (3) Great Lakes, Rocky Mountains, Sierras in Cal. and Wash. Plains region. Southeastern Alaska. (4) New England, N. Y. (5) Trematoda, Cestoda, Nematoda, Acanthocephala. (Will try to identify any endoparasites.)

WATERMAN, WARREN G., 5715 Blackstone Ave., Chicago, Ill. Assistant Professor of Botany, Knox College (A.B., A.M.). (2) Root study. (3) Frankfort, Mich. (4) Conn., central Tenn., Knox Co., Ill., east shore of Lake Michigan. (6) Climatic factors; soil moisture. (7) Atmometer, soil borer.

WATSON, JOSEPH RALPH, Agricultural Experiment Station, Gainesville, Fla. Entomologist. (1) Plant geography of northern central New Mexico. Distribution of animal life in northern central New Mexico. (2) Behavior of scale insects and Aleurodids and their economic importance. (3) Albuquerque, N. M., Gainesville, Fla. (4) N. M., Ill., O. (5) *Aleurodids, Thysanoptera*.

WEAVER, J. E., Station A., Lincoln, Neb. Assistant Pro-

fessor of Botany, University of Nebraska. (1) Evaporation and plant succession in Washington and Idaho. Natural reforestation in the mountains of northern Idaho. Root systems of prairie plants of southeastern Washington. (2) Plant successions in relation to evaporation and soil moisture. Rusts as affecting transpiration. Ecological anatomy. (3) Southeastern Wash., western Idaho, southern Minn., eastern Neb. (6) Quadrat method of studying successions; field instrumentation. (7) Evaporimeters, photometers, geotomes, air-soil thermographs, hygro-thermographs, soil thermometers, psychrometers.

WEBBER, HERBERT JOHN, Citrus Experiment Station, Riverside, Cal. Director (B.Sc., M.A., Ph.D., D.Agr.). (1, 2) The influence of environment on plants. Plant associations and their causes. (3) Neb., Fla. (4) Neb., Cal., Fla. (5) Economic species and species of possible economic importance.

WEESE, A. O., 1213 E. Central Ave., Albuquerque, N. M. Professor of Biology, University of New Mexico (B.A.). (2) Reaction of *Phrynosoma* to evaporation gradients. Color reaction of *Phrynosoma* and other New Mexican Lacertilia. Physiographic ecology of New Mexico. (3) N. M., Chicago region. (4) Southern Minn., San Francisco and Los Angeles regions, Cal. (5) *Phrynosomidae*. (6) As indicated above. (7) Evaporimeters, etc.

WEIR, JAMES R., Laboratory of Forest Pathology, Missoula, Mont. Forest Pathologist, Bureau of Plant Industry; Consulting Pathologist, Forest Service (Ph.D.). (1) Environmental factors in relation to forest tree diseases. Altitudinal range of forest fungi. (2) Influence of climate, soil, elevation, etc., on the distribution, prevalence and vigor of fungous and Phanerogamic parasites in the forest. (3) Northwestern U. S. (4) Central Europe, Ohio Valley. (5) Fungi causing disease in forest trees, especially *Polyporaceae*.

\*WELCH, PAUL SMITH, Department of Entomology, State Agricultural College, Manhattan, Kans. Associate Professor of Entomology (A.M., Ph.D.). (1) General ecology of certain aquatic insects; also Oligochaeta. (2) Habits and behavior of certain aquatic Lepidoptera and Diptera. (3) Douglas Lake, Mich.; Oneida Lake, N. Y. (4) Kans.; Ill.; Woods Hole, Mass. (5) *Enchytraide* (Oligochaeta). *Nymphula* (Lepidoptera). (7) The limnological apparatus in common use.

WELLS, MORRIS MILLER, Department of Zoology, University of Chicago, Chicago, Ill. Instructor in Zoology (Ph.D.). (1) Reactions and resistance of fishes to gases, temperature, acidity and alkalinity. (2) Physiological problems involved in attempting to explain the peculiarities of distribution displayed by many organisms. (3) Chicago region, University of Ill., La Jolla, Cal. (4) Prairies of Kas. and Okla.; mountains of N. M. and Ariz. (5) Fishes. Insects, especially ground beetles and

gall-producing insects. (6) With gradient experiments and the control of various environmental conditions in laboratory gradient experiments. Analysis of water in the field. (7) Atmometers, hydrometers, wet and dry bulb thermometers, plankton nets, dredges, etc.

WEYGANDT, CORNELIUS, University of Pennsylvania, Philadelphia, Pa. Professor of English.

WHEELER, WILLIAM MORTON, Bussey Institution, Forest Hills, Boston, Mass. Professor of Economic Entomology, Harvard University (Ph.D., Sc.D.). (1) Insects, principally ants. (2) Especial interest in ecological work in its bearing on geographical distribution and animal behavior. (3) U. S., Canada, Europe, West Indies, Central America, Mexico, New Zealand, Australia. (5) *Formicidae*. (6) With the usual methods and apparatus employed by entomologists and zoologists.

WHITFORD, HARRY NICHOLS, Yale Forest School, New Haven, Conn. Professor of Tropical Forestry (Ph.D.). (1, 2) Forestry topics. (3) Mich., Mont., British Columbia, Philippine Ids. (4) Various parts of the U. S., Mexico, Federated Malay States, Burma, India. (5) Dipterocarpaceae, Coniferae.

WHITNEY, ALVIN GOODNOW, 260 Buckingham Ave., Syracuse, N. Y. (2) Relation of birds and mammals to forests. (4) New England, central N. Y., northern Va., northeastern Pa.; Pribilof and Aleutian Ids., Alaska.

WODSEDALEK, J. E., University of Idaho, Moscow, Idaho.

WOLCOTT, GEORGE N., Department of Entomology, University of Illinois, Urbana, Ill. Entomologist (B.S.A., M.S.). (1) *Lachnosterna* and *Tiphia* in Illinois. *Diatraea saccharalis* in the West Indies. (2) Insects of sugar cane. (3) Ill., Puerto Rico. (4) La., Cuba. (6) Individual ecology.

WOLCOTT, ROBERT HENRY, University of Nebraska, Lincoln, Neb. Professor of Zoology (A.M., M.D.). (1) Biological conditions in Nebraska. Water mites. (2) An ecological survey of a typical prairie tract near Lincoln, Nebraska. The sand-hill lakes in Cherry Co., Nebraska. The pine ridge and cañons in Sioux Co., Neb. (3) Neb., southern Mich., northern Minn. (4) New England, Ill., Mo. (5) Vertebrates. Lepidoptera and Coleoptera. *Rhopalocera*; *Cicindelidae*; *Acari*, especially *Hydracarina* (water mites). (7) Recording hygrograph, thermographs and other field apparatus.

WOOLSEY, THEODORE SALISBURY, JR., Stonyeroft, Albuquerque, N. M. Formerly Assistant District Forester in Charge of Silviculture, District 3, U. S. Forest Service (B.A., M.F.). (1) The red pine in the Lake States. Western Yellow Pine in Arizona and New Mexico. (2) Silviculture, and factors influencing silvicultural methods. (3) Ariz., N. M. (4) Southwestern U. S. and Cal.; southeastern U. S. and Fla.; New England; France, Switzerland, Austria, Caucasus, Corsica, India.



WRIGHT, ALBERT HAZEN. Cayuga Heights, Ithaca, N. Y. Assistant Professor of Systematic and Field Zoology, Cornell University (A.B., A.M., Ph.D.). (1) Fishes, Amphibians, Birds, Reptiles and Mammals. (2) Geographic Distribution of North American Vertebrates. Amphibia and reptiles of Georgia. Life histories of North American Salientia. Bird migration. Systematic and life history studies of fishes. (3) N. Y., Ga., Fla., Mass., Ontario. (4) Eastern U. S. (5) North American Vertebrates. *North American Amphibia and Reptiles*. Fresh-water fish.

YOUNGS, HOMER S., Missoula, Mont. Grazing Examiner, U. S. Forest Service. (2) The effect of grazing on plant succession. Comparative resistance of different plants to grazing. (3) Mont., southern Idaho. (4) Northwestern S. D., northern Idaho, northeastern Wash., southwestern N. D., western Wyo. (5) All plants poisonous to range stock, especially *Lupinus* and *Astragalus*. Coniferae, Compositae. (6) Chart and list quadrats. Forestry methods.

ZETEK, JAMES, Box 245, Ancon, Canal Zone. Entomologist, Republic of Panama (B.A.). (1) Behavior of malarial mosquitoes. (2) Behavior of fleas. Ecology of forest-inhabiting snails. Ecology of plague. Behavior of insects and snails. (3) Ill., Canal Zone, Panama. (4) Southeastern forest province of U. S. (5) *North American Land Shells, Fresh-water Shells of the United States*. Land and marine Mollusks, Coleoptera, Orthoptera, reptiles and batrachians of Panama.

ZON, RAPHAEL, Forest Service, Washington, D. C. Chief of Forest Investigations, U. S. Forest Service (F.E.). (1) Silviculture. Forest conditions. Factors determining forest types. (2) Factors affecting forest distribution. (3) Forested portions of the U. S. (4) Southeastern U. S. (6) Study of natural forest vegetation, natural and artificial reproduction. (7) Meteorological instruments.